Convention of Cotton Manufacturers in Boston

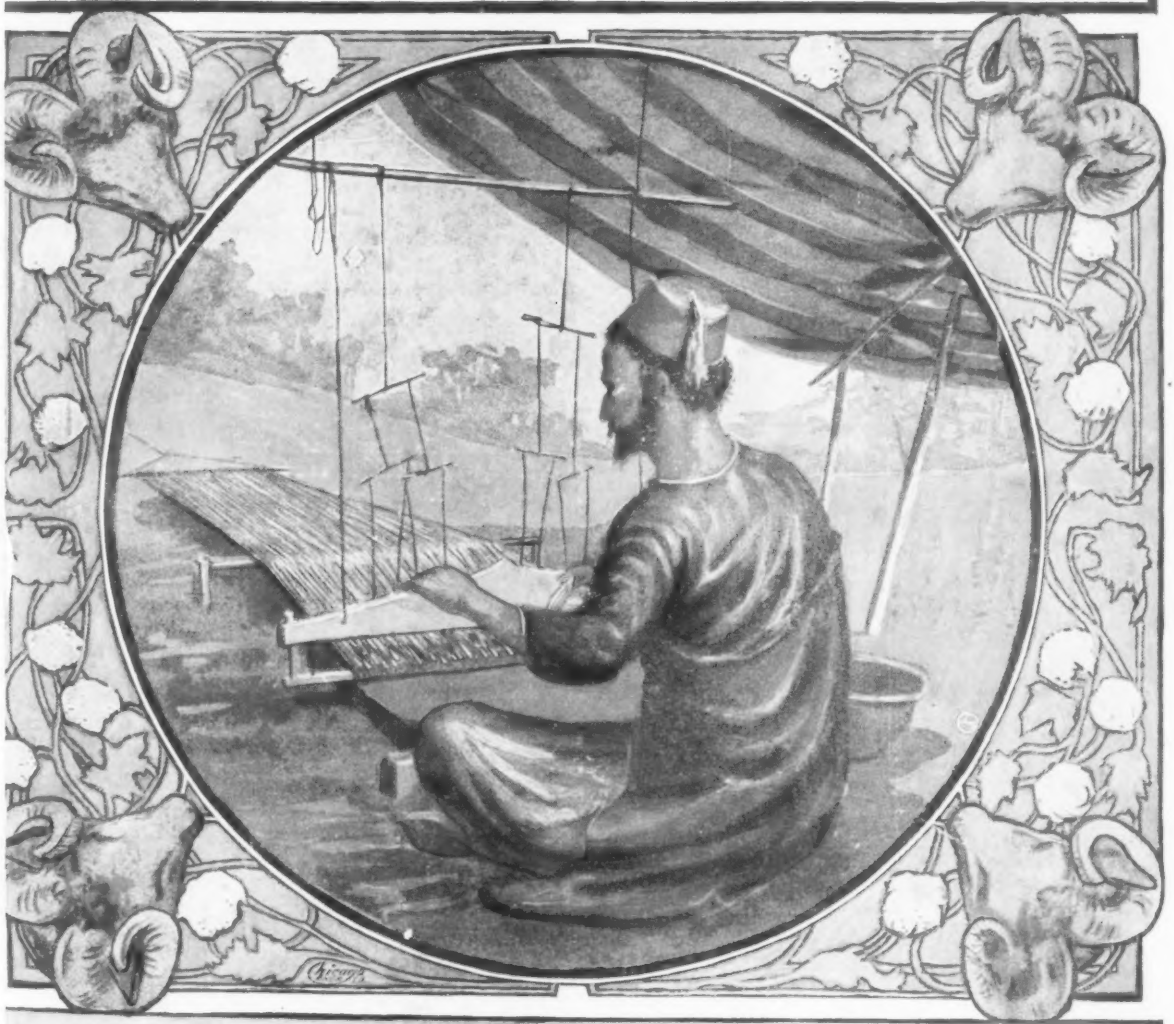
olume XXXVII.
umber 2.

MAY, 1909.

$2.00 per year.
$3.00 with Directory.

PHILADELPHIA TEXTILE SCHOOL LIBRARY MAY 1910

TEXTILE WORLD RECORD



LORD & NAGLE COMPANY ~ BOSTON · MASS.

ble of Contents, Page 75. Buyers Index, Page 219. Index to Advertisements, Page 229.

Convention of Knit Goods Manufacturers in Philadelphia

Mercerizing Machinery for Piece Goods

— AND —

Yarns in the Warp or Chain

All Kinds of Outfits for Bleaching Thread and Soft Twisted Yarns.
Bleaching Machinery for Yarns in the Warp or Chain.

BLEACHING
DYEING
DRYING
AND
FINISHING
MACHINERY

Singeing Machines, Boiling Kiers, Washers. Water, Chemic and Sour Squeezers.

Rusden Patent, Continuous Chainless Steamer, Aniline Agers.

Dyeing Machines, Open Soapers, Blanket Washers, Color Kettles, Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders.

Water and Starch Mangles, Automatic Tentering Machines, Dyeing Machines for Chain Warps.

Dampening Machines, Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, etc.

Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-Deposited Copper Rolls for all purposes.

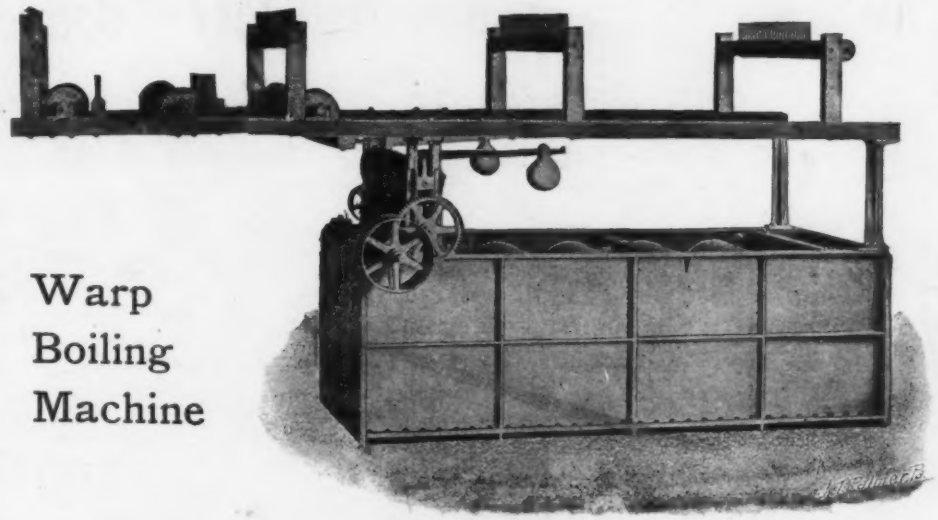
Padding and Drying Machines for Shade Cloths, Single and Double Cylinder Engines, Hydraulic Presses and Pumps.

Estimates, Drawings and full particulars of complete plants furnished on application

THE TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

STUART W. CRAMER, Southern Representative, Charlotte, N. C.



Warp
Boiling
Machine

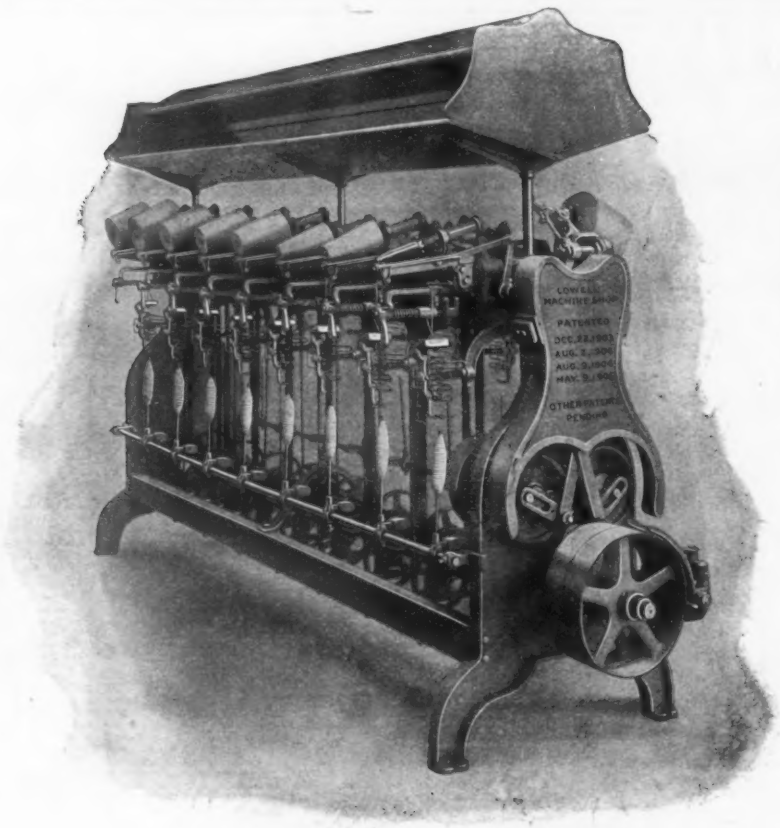
Bleaching,
Dyeing,
Drying,
Finishing
Machinery

for all textile fabrics.

H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA.

Providence Office, Room 417, Industrial Trust Building.



Foster Camless Winder

CONES AND TUBES

20,000

SPINDLES IN OPERATION

OPEN-WIND

LOWELL MACHINE SHOP

If your fingers are all thumbs why try to sort travelers by hand?

Let

Duckworth's Traveler Magazine

Do the work

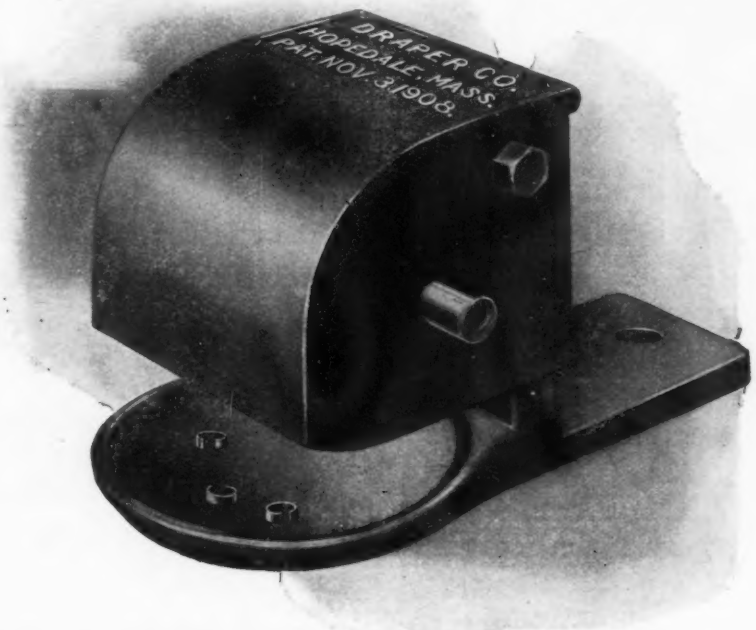
and save one half the travelers

Draper Company

Hopedale, Mass.

J. D. CLOUDMAN, Southern Agent

40 So. Forsyth St., Atlanta, Ga.



THE EMPHATIC SUCCESS OF OUR "IDEAL" AUTOMATIC LOOM IS DUE TO SEVERAL SALIENT POINTS OF SUPERIORITY OVER ALL COMPETITORS:

1st. The ease and smoothness with which they start up.

2d. The acknowledged superiority of the cloth woven.

3d. Simple and thoroughly mechanical construction, assuring freedom from the constant breakage and expensive repairs attending other automatic looms.

4th. No special bobbins, shuttles or other expensive parts.

5th. Ability to use cop or bobbin filling interchangeably.

6th. Superiority of warp stop motion which does not break or fray the softest yarn.

7th. Of the thousands in operation not a single bobbin or crank shaft broken.

IN PROOF OF CLAIMS WE POINT TO THOSE MILLS FORMERLY USING OUR COMPETITORS' LOOMS THAT ARE NOW USING OURS.

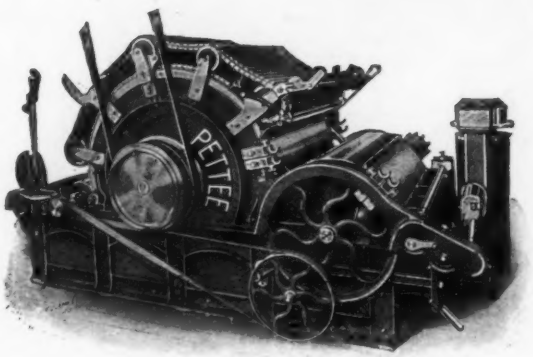
The Stafford Company

Readville, Mass.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



Revolving
Flat Cards,
Lap Winders,
Drawing
Frames,
Railway Heads,
Slubbing,
Intermediate
and
Roving
Frames,
Spinning Frames,
Spoolers
and
Reels.

Shops—

Biddeford, Me.

Newton Upper Falls, Mass.

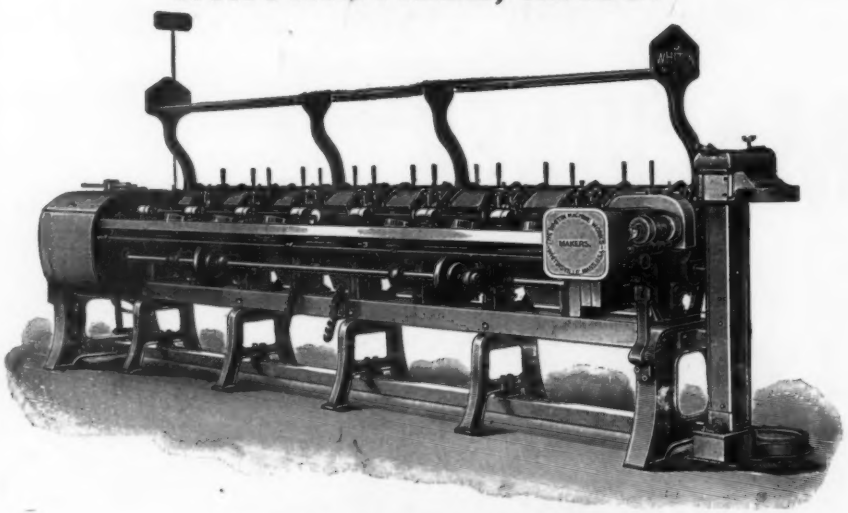
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



HIGH SPEED COMBER 1906 MODEL.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines, Combers,
Railway Heads, Drawing Frames,
Spinning Frames, Spoolers, Twisters,
Long Chain Quilling Machines, Reels, Looms.

Southern Agent,
S. W. CRAMER

Trust Building, CHARLOTTE, N. C.
Equitable Building, ATLANTA, GA.

"Kitson Products"

Blowing Systems

For Conveying Bale Cotton
from Storehouse to Picker-room

Self-Feeding Openers
Lappers and
Cleaning Trunks

Waste-Working Machinery

Raw Stock Cotton Dryers

We own the Patterns and can furnish REPAIR PARTS for PICKERS
formerly built by

WHITEHEAD & ATHERTON, . Lowell, Mass.
ATHERTON MACHINE CO., - - Lowell, Mass.
A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

Kitson Machine Shop

Lowell, Mass.

SCOTT & WILLIAMS

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BUILDERS OF

Full Particulars, Samples and Special Catalogues on Application.

Rib Knitting Machinery for Underwear and Hosiery

Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

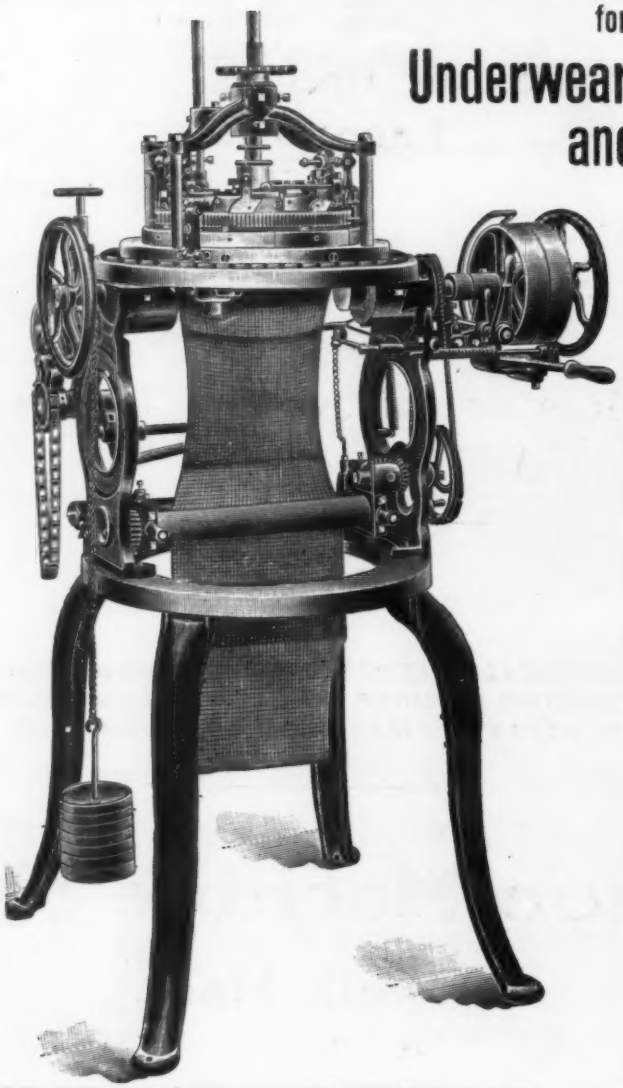
Improved Measuring Device, by actual length knit.

Sizes 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, 4 to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters, etc.



The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

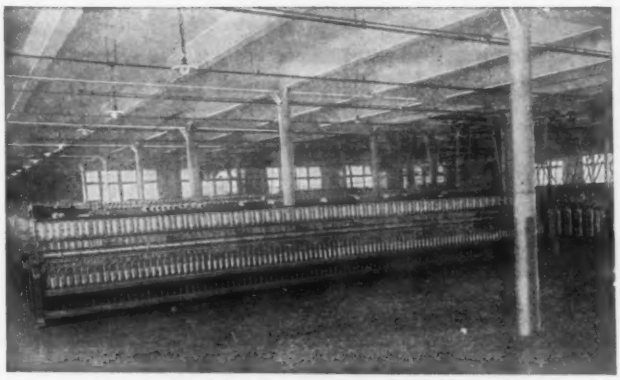
for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.

We build Loopers, Ribbers and other Machinery for Knitting Mills

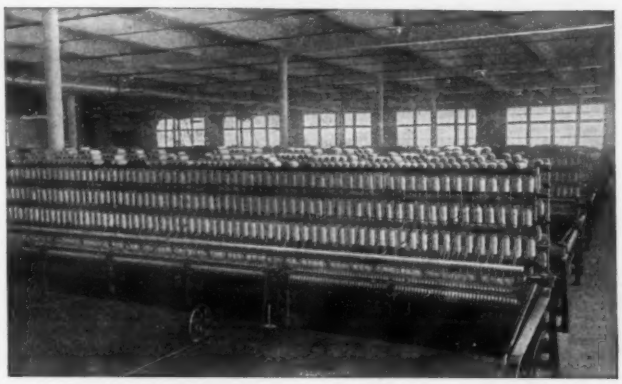
As well as

A Complete Line of Full Automatic and 7-8 Automatic Seamless Hosiery Machinery.

Do You Know How It is Done?



Carding—60% Humidity.



Mule Spinning 70% Humidity.

Weaving—80% Humidity.

(130-C)

These illustrations show the interior of a mill equipped with a single Carrier humidifier, located in the basement, giving the different humidities in each department as indicated under illustrations.

The humidity is automatically regulated (without any attention) within a variation of two per cent.

The same apparatus cools in summer and heats in winter.

Our catalog with notes on humidity yours for asking. Our engineers will call upon request to give any desired information.

Carrrier Air Conditioning Co.
of America.

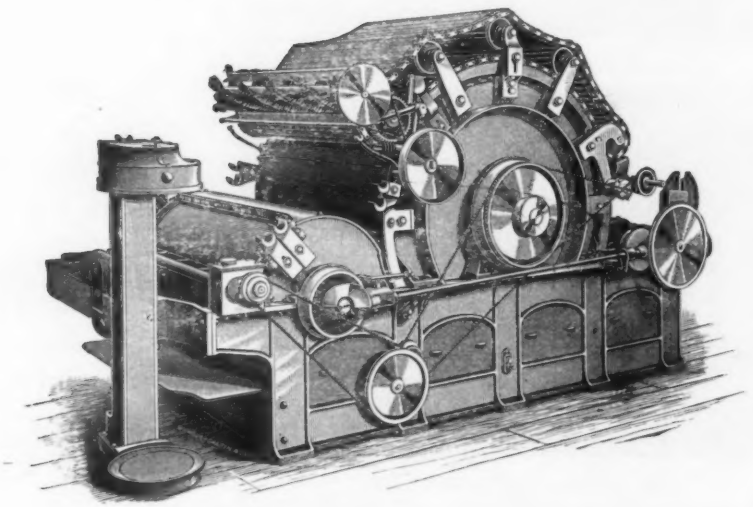
39 Cortlandt Street,
New York.

Cotton Machinery

MASON MACHINE WORKS,

TAUNTON, MASS.

Southern Office,
Charlotte,
N. C.



Cards,
Combers, Railway
Heads, Drawing Frames
Spinning Frames, Mules and Looms

INCLUDING

Plain and Fancy Silk Looms

High speed, self-oiling winders for coning, tubing, doubling. Also for cotton, silk, woolen and worsted filling for weaving.
Universal Winding Company, Boston
Sole Manufacturers of
"UNIVERSAL" WINDING MACHINERY
Several styles of machines of heavy construction for thread, twine and cords.

IMPORTANT ANNOUNCEMENT

Manufacturers are hereby warned against using infringements upon the Cramer patents for

Automatic Regulators for Humidifying Systems

Before considering the purchase of infringing devices, make sure that the vendor is amply financially responsible and guarantees to imdemnify the purchaser against loss by damage suits, for both infringers and users of infringements, however crude such infringements may be, will be prosecuted to the full extent of the law.

Don't be imposed upon by misleading terms and claims as to what the vendor's patents cover; anyone can get a patent for almost anything in the way of specific constructions; the vital question is whether or not such patents infringe other prior patents.

Cramer System of Air Conditioning

Spray Humidifiers as good as the best, of large capacity, durable, sanitary, air cleansing and efficient.

Air Conditioners *comprising all the good points of spray humidifiers*, particularly as to large moistening capacity and simplicity; *combined with the good points of evaporation types of humidifiers*, such as complete evaporation of the moisture, large air cleansing capacity and good distribution; *and without the objectionable features of either type*, such as wetting down, localized moistening, large and clumsy constructions, unsanitary conditions due to difficulty of access for cleaning and to the use of wet absorbent disease-breeding materials, and largely reduced efficiencies at all except the lowest humidities,—*features*, simplicity, durability comprising only seamless drawn sheet copper casings, a spray nozzle and a fan. The fans are either electrical driven, or mechanically driven with belts or ropes as the special requirements of each case dictate.

STUART W. CRAMER

Providence, R. I. **Charlotte, N. C.** **Atlanta, Ga.**

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT

IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8" stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery.
Archbutt-Deeley System for purifying and softening water.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

JOSEPH SYKES BROS.,
Card Clothing for Cotton.

JAMES CRITCHLEY & SONS,
Card Clothing for Woolen and Worsted.

WILSON BROS. BOBBIN CO.'S.

Bobbins, Shuttles, etc.

Dronsfield Bros. Grinding Machinery and Emery Filleting. The Best French and English Combing and Rubbing Aprons. Harding's Pins and Circles. Varey's Fallers, etc.

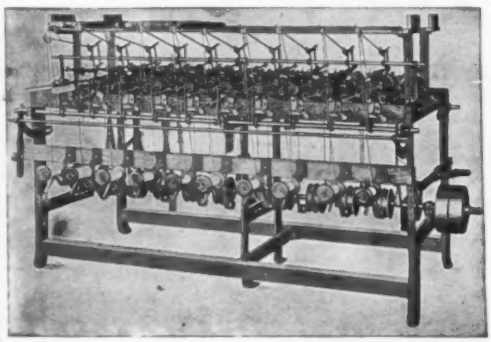
OSWALD LEVER CO.

(Formerly LEVER & GRUNDY.)

Lehigh Ave. and Mascher Sts., PHILADELPHIA, PA.

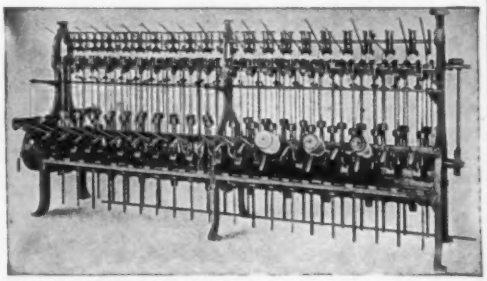
MANUFACTURERS OF TEXTILE MACHINERY.

SOLE MAKERS OF OUR PATENTED SPECIALTIES IN THE UNITED STATES.

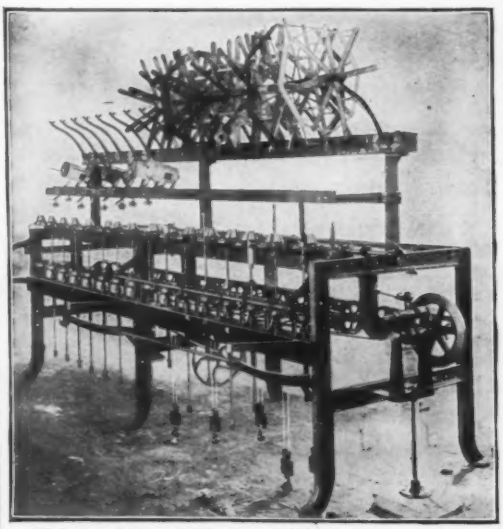


This Machine may be arranged to wind from skeins, spools, cones, or any kind of spinning bobbins. Most suitable machine for cotton or woolen blankets.

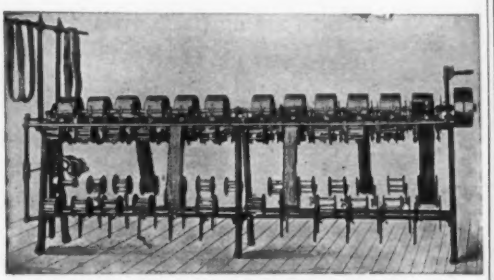
Conical and Parallel Tube Winding Machines; Warping Machines and Creels; Brass Bobbin Winding and other Machinery for lace mills; Chenille Cutting Machines, Sectional Warping Mill, Beaming Machines, etc; Cop Winding Machines for butts to weave from outside; Filling Bobbin or Quill Winding Machines; Vertical Spindle Spooling Machine for silk, fine cotton, wool and worsted; Variable Speed Bobbin Machines for large bobbins used in knitting mills; Dresser Spooling Machines; Reeling Machines.



Vertical Spindle Gear Driven Winder, as used by all manufacturers of heavy duck, jute, cotton, bagging and carpets.



High Speed Cross Quiller to wind from skeins, spools or mule cops on two quills or paper tubes. It is built to run from 1800 to 2400 revolutions.



Pressure Drum Spooling Machine. This machine is adapted for spooling any kind of yarn, whether from mule cops or skeins.

JAMES HUNTER MACHINE CO.

NORTH ADAMS, MASS., U. S. A.

Piece Dye Kettle. *Bulletin 53*

The Hunter PIECE DYE KETTLE

A machine that produces results.

No Shading or Uneven Dyeing.

Tank made of 3" CLEAR CYPRESS.

Tongued and Grooved and thoroughly boltcd.

IMPROVED HUMP REEL

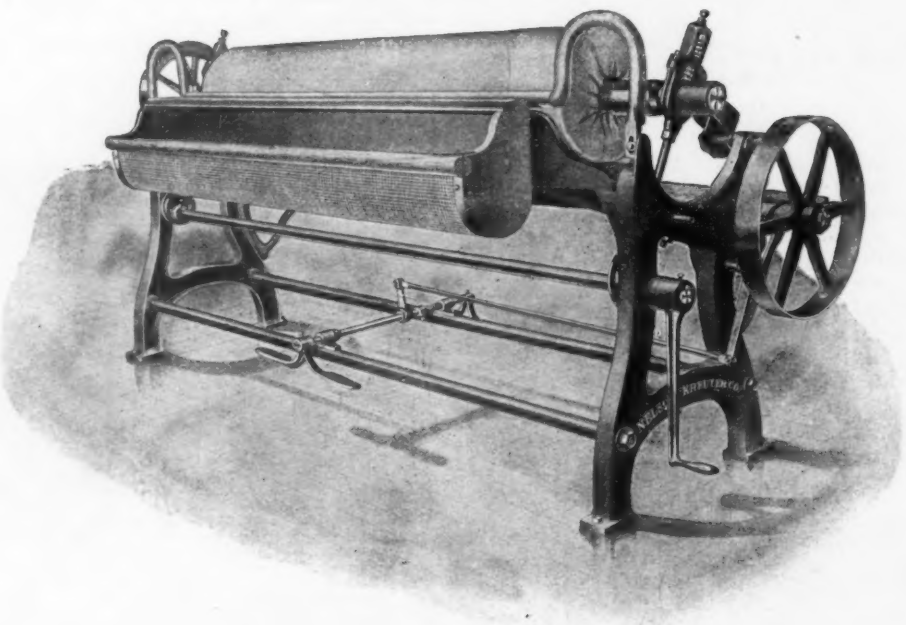
FRICTION PULLEY DRIVE

The heaviest, most substantial dye kettle built.

Any size for any number of strings.

Send for Bulletin No. 53.

UNDERWEAR and HOSIERY IRONER



This machine is specially adapted for ironing ribbed and flat underwear and knit goods. The pressure is adjustable and this feature in connection with the padded roll eliminates the possibility of breaking buttons. The machine is very inexpensive to maintain, is easily operated, and gives the goods a smooth, fine finish. Every mill should own one of these ironers.

The American Laundry Machinery Mfg Co

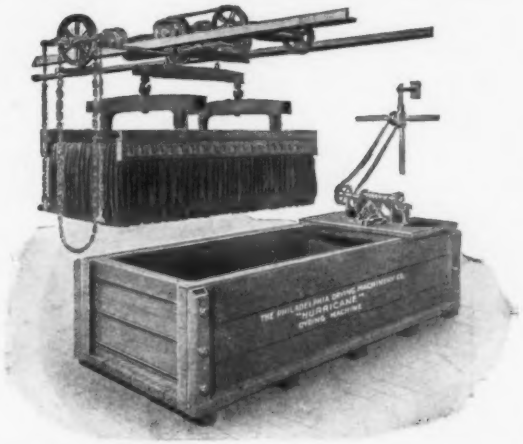
Western Division 78-80 Franklin St. Chicago

Eastern Division 132-138 W. 27th St. New York

Southern Division Station H Cincinnati

SAVE IN DYEING

75% in Labor
50% " Steam
35% " Dyes



"HURRICANE"

Circulating Dyeing Machines

For Yarn, Hosiery, Etc.
Are in a Class by Themselves

Patents No. 918,484 and 918,485
April 13, 1909.

ALL INFRINGEMENTS WILL BE PROSECUTED

SINGEING

HOSIERY, WITHOUT BOARDS,—COSTS LESS THAN HALF

What you have paid heretofore
BY USING

"Hurricane" Automatic Singeing Machines

Patent No. 895,711, August 11, 1908
" " 919,999, April 27, 1909

Power Screw and Hydraulic

PRESSES

For Hot or Cold Finishing, make higher prices possible on account of the better finish of the goods.

THE PHILADELPHIA DRYING MACHINERY COMPANY

"Hurricane" Dyeing, Drying and Finishing Machinery
Complete Equipments for Scouring, Bleaching, Carbonizing, Etc.
6721 Germantown Ave., Philadelphia, Pa.

"DUXBAK" IS THE ONLY BELTING FOR THAT JOB

The continual shifting and sudden loads thrown on metal planer belts subject them to the greatest strain.

The Waterproof quality of Schieren's Duxbak Leather Belting prevents moisture and heat from changing its length—adds strength to the leather and increases the arc of the pulley wrap.

We make six different styles of beltings—each suited to its particular work and guaranteed.

Send for a copy of our guarantee and price list.

DUXBAK BELTING TRADE MARK

DUXBAK BELTING TRADE MARK

Chas. A. Schieren Company ESTABLISHED 1848

TANNERS
BELT MANUFACTURERS

NEW YORK, 29 Ferry St.
PHILADELPHIA, 226 North 3d St.
CHICAGO, 84-86-88 Franklin St.
BOSTON, 641 and 643 Atlantic Ave., opp. South Station.
PITTSBURG, 240 Third Ave.
DENVER, 1622 Wazee St.
BROOKLYN, N.Y., cor. 13th St. and 3d Ave.
HAMBURG, GERMANY, Auf dem Sande 1.
OAK LEATHER TANNERIES, Bristol, Tenn.

Gums, Dextrines, Corn, Wheat & Potato Starches

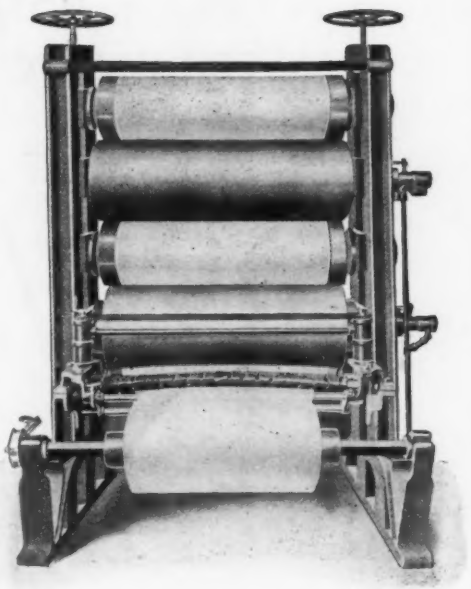
Soluble Starches, Softeners, Etc.

Thos. Leyland & Company

F. T. WALSH, Manager

60 India Street, Boston, Mass.

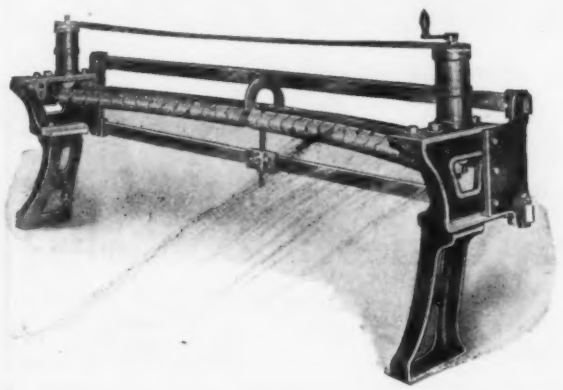
The William Mycock Regulating Cloth Expander



This cloth expander does not in any way disturb the surface of the cloth, even on napped goods. It brings goods to any desired width without strain, the stretching taking place uniformly over the entire width. The result is that the weft is undisturbed being left at right angles with the warp.

The cloth is operated upon on both sides, therefore, there is no folding or creasing of selvedges.

This expander is very powerful and where an excessive width is not required does away with stentering.



Wide Expander With Center Support

The center support gives this expander the necessary strength, and allows width not otherwise obtainable. We have made this wide expander up to 125 inches in width.

American Textile Specialty Machinery Co.

670 Eddy St., Providence, R. I.

MANUFACTURERS OF

SHUTTLES AND SHUTTLE IRONS

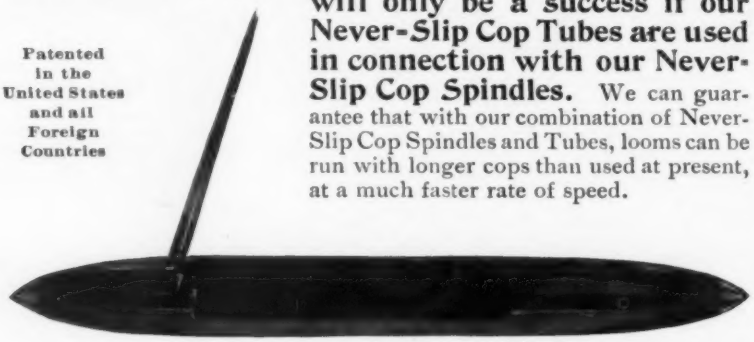
FOR ALL TEXTILE PURPOSES

Never-Slip Cop Tube

Patent applied for.

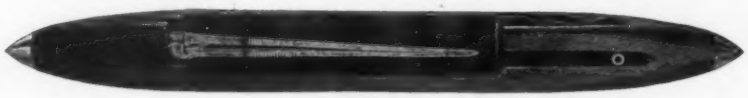
Filling-Waste is reduced to nothing and long Cops will only be a success if our Never-Slip Cop Tubes are used in connection with our Never-Slip Cop Spindles. We can guarantee that with our combination of Never-Slip Cop Spindles and Tubes, looms can be run with longer cops than used at present, at a much faster rate of speed.

Patented in the United States and all Foreign Countries



Shuttle with Spindle Raised

U. S. Patents: 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending



Shuttle with Spindle Lowered

U. S. Patents; 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending

We also manufacture a complete line of

Paper Cop Tubes, Cones and Shells

Send your samples and we will quote prices on any lot desired

New York Office, 363-373 Rider Ave.

General Electric Company

Individual Motor Drive in the Picker Room

In a picker room the nearest approach to ideal operating conditions is attained when each machine is driven by an individual General Electric motor.

There is no doubt about this in the minds of those who use General Electric motors.

One mill superintendent says:—

"The individual drive in our picker room is giving entire satisfaction. It is much better than the old method of driving from shafting, besides it saves in power, as there is no shafting to drive, and when the pickers are stopped, they are not consuming any power."

If you are building a new mill or changing an old one, our Mill Power Department would like to discuss the matter with either your Consulting Engineer or your Superintendent.

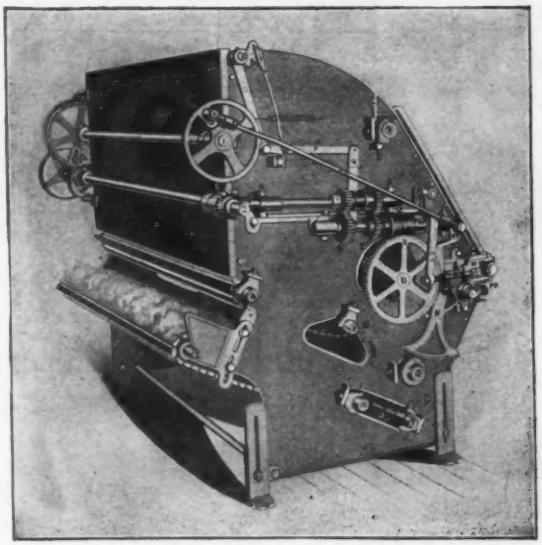
Mill Power Dept
84 State Street
Boston, Mass.

Principal Office
Schenectady, N. Y.

New York Office
30 Church Street

3129

THE FISHER PATENT CARD FEED



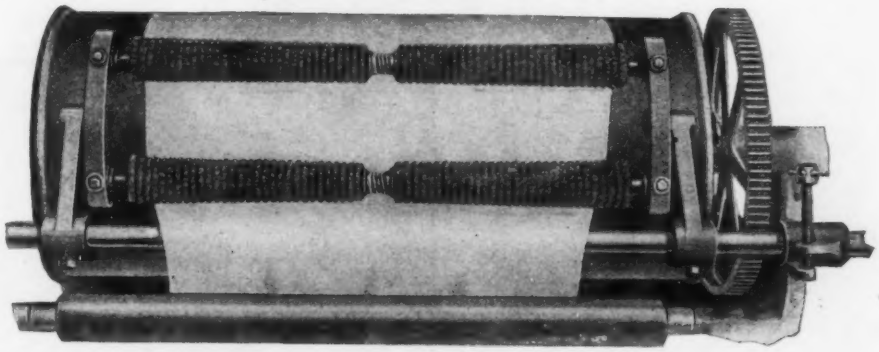
Write Us For List of Mills Where Machines Are Used.

Woonsocket Machine and Press Company

WOONSOCKET, R. I.

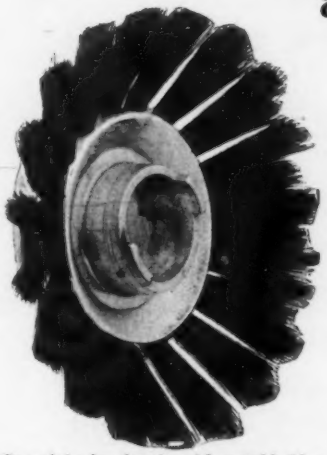
New Bristle Cloth Stretcher

(PATENTED)



THE NEW PRINCIPLE FOR CLOTH STRETCHING

Equally Efficient on and Adjustable to all Fabrics



One of the brush units with metal holder not affected by heat or moisture.

Any Degree of Stretch May be Obtained.
Stretches Starched or Unstarched Goods.
Prepares Cloth to Take Rubber Better.
Smooths and Stretches Cloth Before Calanders.
May Be Applied to any Part of the Cans.
Stretches from the Centre Toward the Selvedge.
Indestructible Brush Holders.
Gets the Full Width of the Goods.
No Threading Up of Machine Required.
No Injury to Employees Possible.
Adds a Superior Finish to the Goods.
Prevents Wrinkles in Silk Printing.
Sold on Approval.

American Finishing Machinery Co.,

141 Milk Street, Boston, Mass.

4 Cannon Street, Manchester, England.

Globe Cotton Softener

is a pure soluble product made from vegetable oil which replaces TALLOW and other substances as a softener and lubricant in the sizing, dyeing, finishing and bleaching of cotton yarns, fabrics, knit goods, etc.

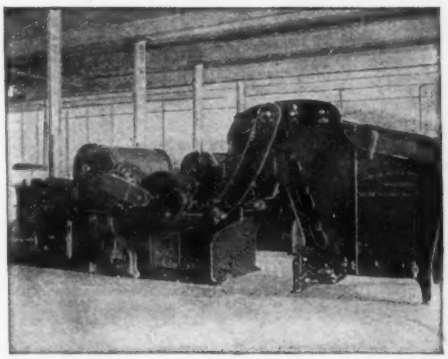
Globe Cotton Softener modifies the stiffness and harshness due to the materials used in the various process.

When used by itself for softening, "oiling" or "greening" bleached and dyed goods, yarns or **knit** goods gives a full mellow feel and brightens the colors **without** greasiness.

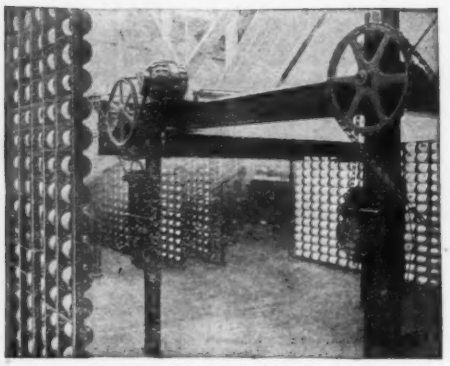
Corn Products Refining Co., New York

Westinghouse

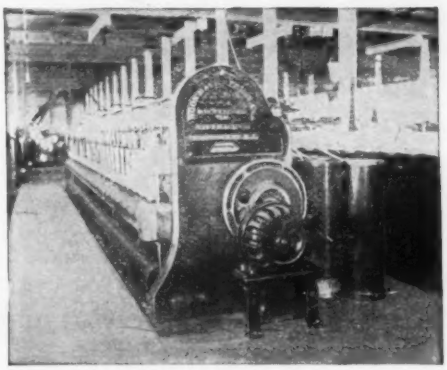
Textile Motors



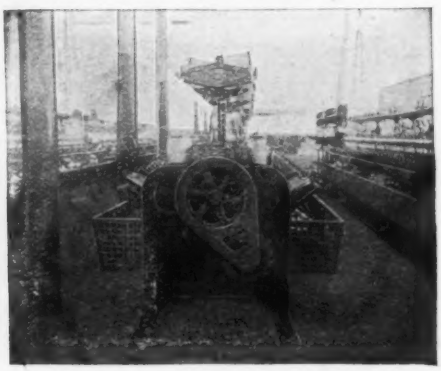
Westinghouse Motor-Driven Picker with Automatic Picker.



Westinghouse Motor-Driven Denn Warper.



Westinghouse Motor-Driven Slubber of 56 Spindles.



Westinghouse Motor-Driven Whitin Spooler, 100 Spindles.

Every textile machine individually driven by a Westinghouse Textile Motor has developed a greater producing capacity and yielded a better quality of product. We illustrate a few examples of individually-driven textile machines in modern mills.

In our "Textile Motor Talks" will be found the latest information concerning electrical equipment of textile machinery and mills.

Westinghouse Electric & Mfg. Co.

Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City, San Francisco, Seattle, Syracuse

Canada: Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Mexico: G. & O. Braniff & Co., City of Mexico

New Process Noiseless Pinions

Make an ideal motor drive.

By their use you secure a noiseless positive drive with no decrease in efficiency. They will wear like iron.

NEW PROCESS PINIONS also reduce objectional vibrations and are therefore, the best for high speed drives.

New Process rawhide is cured by our secret process which makes it different from the ordinary kind.

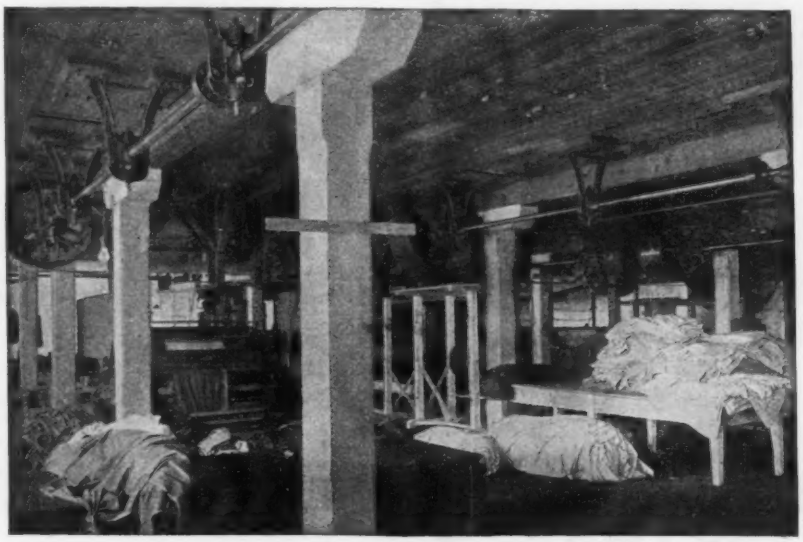
For twenty years we have been making gears and we stand back of our product with a guarantee as to quality and workmanship.

We make all other kinds of gears as well as rawhide. May we tell you more about them?

Descriptive Catalogue for the asking.

The New Process Raw Hide Company

Syracuse, N. Y.



The Dodge Line

embraces everything for the mechanical transmission of power from the heaviest rolling mill equipment to the smallest countershaft.

Every installation, large or small, is given the benefit of our twenty-five years experience in this field.

Dodge Transmission Equipments are operating today in some of the largest textile mills in this country. And they are operating with the best economy and efficiency.

If you would like our General Catalog C-7 and bulletins of the different articles of the Dodge Line, fill out and return the coupon.

Dodge Manufacturing Co.
Mishawaka, Ind.

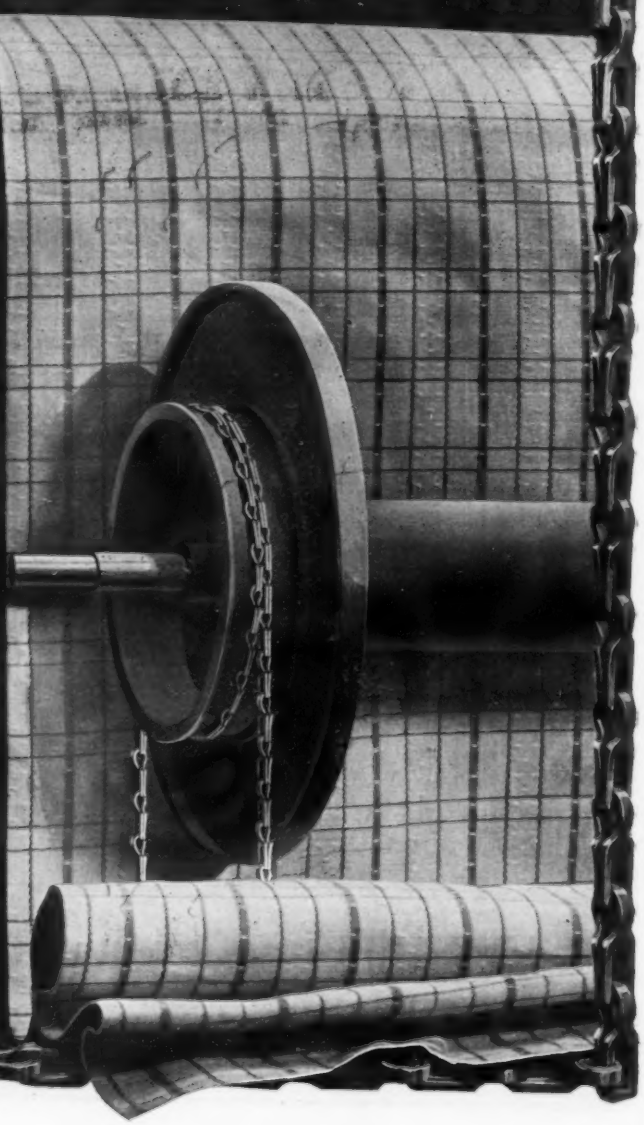
Sta. E.-46

DODGE MFG. CO
Mishawaka
Sta. E-46
INDIANA

Send me your general Catalog C-7 and Bulletins on the Dodge Line.

Name.....
Firm .....
Position .....
City.....State.....

COMMUNITY "FRICTION CHAIN" FOR LOOMS



PERFECTS THE WEAVE

Insures even and uniform friction.

Not affected by dampness or dryness.

Will not stretch. Adapted to heavy or light weaving.

Will outwear cord, band or rope many times over.

Saves labor.

Easily adjusted.

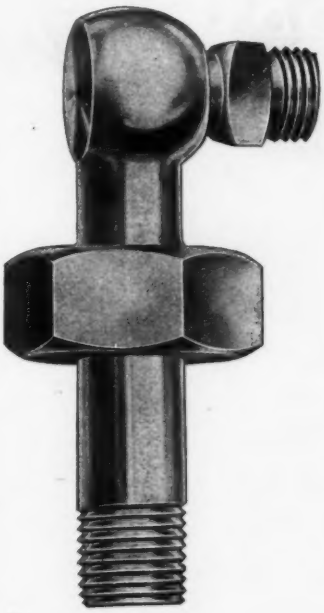
Carried by all the leading supply houses.

We earnestly solicit your orders.

ONEIDA COMMUNITY, Ltd.
ONEIDA, N.Y.

The Turbo-Humidifier

The Humidifier with the Guarantee



ACTUAL SIZE.

A CERTAIN Manufacturer wished to satisfy himself as to the relative merits of two well known Humidifiers, the Turbo—and another.

In a room prepared especially for the test, as nearly air tight as possible, he ran a series of experiments, to see how long it would take to raise the humidity to a given point.

The Turbo gave time results 10 to 15% better than the other. If you wish to know the gentleman's name we will advise you. Perhaps he will tell you the name of "the other."

TURBO TRADE MARK HUMIDIFIER

The G. M. Parks Company

Sole Agent

FITCHBURG, MASSACHUSETTS

Southern Office, No. 1 Trust Building, Charlotte, North Carolina

B. S. COTTRELL, Manager

RUBBER

New Rollers Complete

COVERED

Rollers Re-covered

ROLLERS

All our rubber coverings for rollers are made with the utmost care from carefully selected gums of prime quality.

Rubber roll coverings of our make are live, resilient and durable. Measured in service results they are the best value which it is possible to procure.

We make various consistencies of coverings that are perfectly adapted for textile mill purposes.

Correspondence invited.

Rubber Belting, Hose for all purposes.
Packings, Gaskets, Valves, Etc.

MANUFACTURED BY

BOSTON BELTING CO.

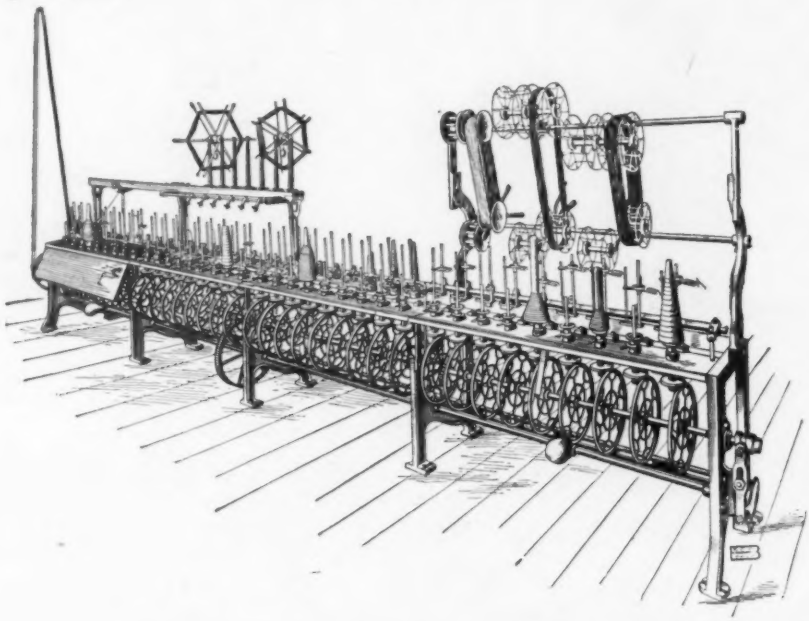
JAMES BENNETT FORSYTH, Mfg. Agt. and Gen. Mgr.

Boston New York Buffalo Philadelphia Atlanta

KAUMAGRAPH
OVERLOCK SEAM
DOUBLE THREAD
TRADE MARK
Darnomore Hose
MARK
PEN
WARRANTED HIGH
PENMAN
ANGLE
GRADE
UNDERWEAR
REGISTERED
RENFREW
ARLINGTON MILL
AMERICAN HOSIERY CO.
9½
H.M.C.K. (WEAR GUARANTEED)
Shackamaxon
BURLINGHAM SACKING
TRADE
Holproof
MARK
SATIN
PM
ANCAISE
WELLINGTON CLOTH
TRADE MARK
GUARANTEED
FAST
TRIUMPH
DYE
STAINLESS
FULL STANDARD SIZE
42
NEW YORK
TALBOT MILLS
Everwear
Theodora Cloth
Borambo
BRADFORD MILLS
John & James Dobson
Germantown-Pa.
Guaranteed
Detmer's
All Pure Wool
READ'S FABRICS
IVAN SIMONIS
QUALITY
THE
WAIST
15
GRÈPE ENA
Hydegrade
Sakana
SUPER
ATHENS
EGYPTIAN
TRADE MARK
Y NOT
REGISTERED
DOROTHY DAINTY (S Y K) QUALITY GUARANTEED
SULTAN MILLS
THE CONSPICUOUS TEXTILE SUCCESSES ARE STAMPED BY THE KAUMAGRAPH PROCESS
"KAUMAGRAPH COMPANY, 156 FIFTH AVE., NEW YORK"

Improved Narrow Fabric Warper

This new Warper for Narrow Fabrics lays the warps perfectly flat on the beam without twisting or bunching the yarn at the corners. The beams are arranged with a hole for spindle or trunion journals on heads. This latter is something quite out of the ordinary and is so arranged to carry from three to six warp beams.



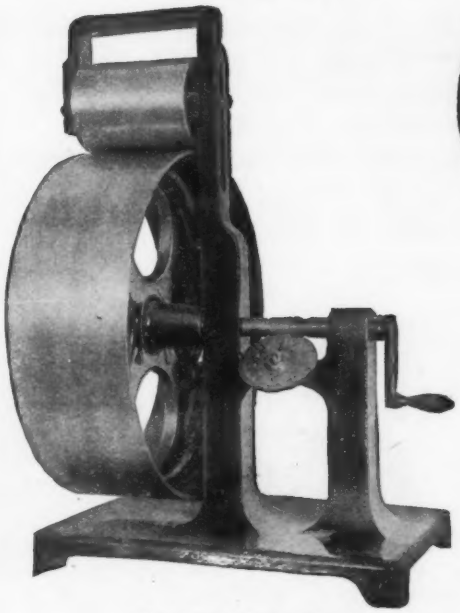
Latest Skein Winder

The illustration shows the last winder in the field but the first to show how to wind skein yarn successfully at low cost. Competition in price is not our object and the merits of the machine for value received is our claim and guarantee.

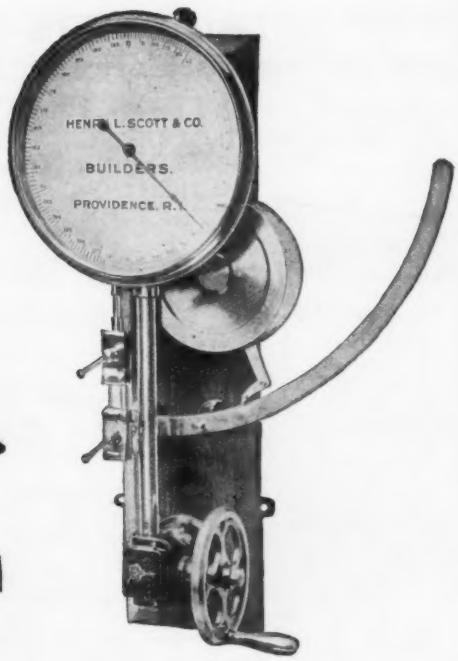
JACOB K. ALTEMUS

Textile Machinery

2824 No. 4th Street, - Philadelphia, Pa.



36 INCH ROVING REEL



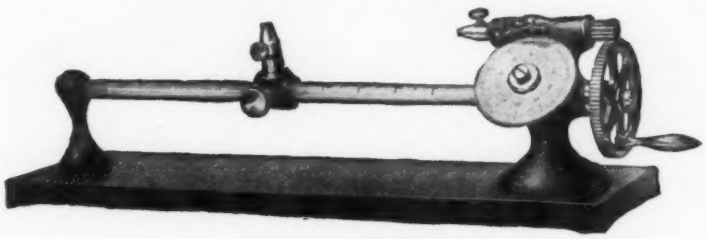
CLOTH TESTER
PATENT APPLIED FOR

HENRY L. SCOTT & CO.

225-233 Eddy Street, - - PROVIDENCE, R. I.

—— BUILDERS OF ——

Automatic Power and Hand Driven Yarn and Cloth Testers, Roving Reels, Thread Inspectors, Twist Counters, etc.



TWIST COUNTER

SMITH, DRUM & CO.

"BUILDERS OF THE BEST"

Labor Saving Machinery for Dyeing, Singeing and Finishing

HOSIERY

IN SULPHUR, ANILINE, DEVELOPED BLACKS AND COLORS
POWER SCREW PRESSES and MERCERIZING MACHINES

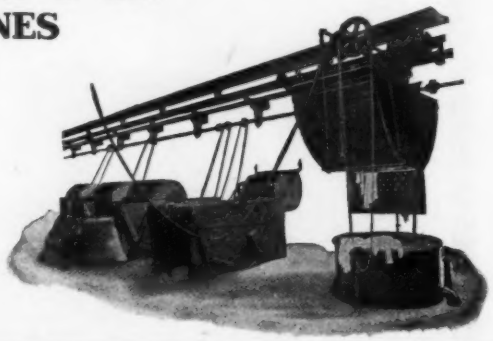
SAVE LABOR and **DYE STUFF** and do **BETTER WORK** in your dye house by using

SMITH, DRUM & CO. MACHINES

Full Particulars on Application

CORAL AND CUMBERLAND STREETS

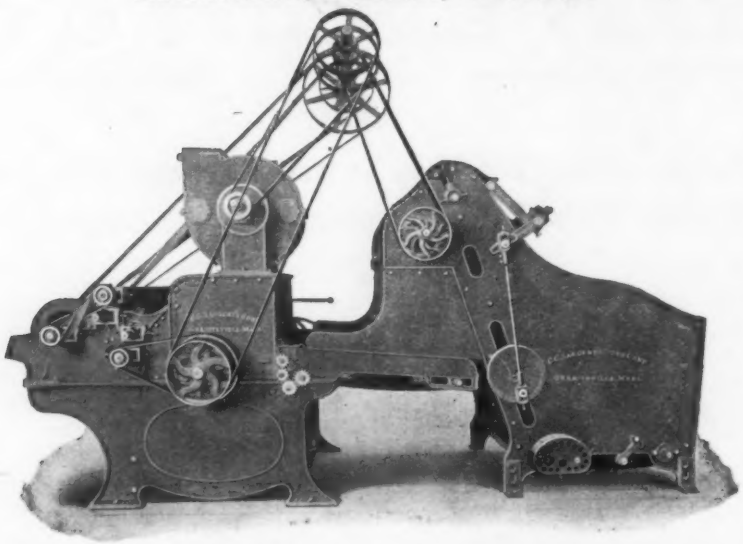
PHILA., PA.



C. G. SARGENT'S SONS

CORPORATION

GRANITEVILLE, MASS.



Multiplex Burr Picker and Self Feed.

The advantages of this Burr Picker are readily apparent to any practical mill man. It is the only Burr Picker having two guards, both of which knock the burrs out of the machine, and away from the approaching wool. Both surfaces of the lap of wool are cleaned. Our catalog tells more about it, shall we send it ?

JAMES SPEED HARRY STEPHENSON

Speed & Stephenson

Worsted Machinery

170 Summer Street, Boston, Mass.

Sole Selling Agents

for

Improved Noble Combs

Built by

JAMES SMITH & SON

Worcester, Mass.

(See Illustrated article in this issue.)

Also representing leading European Manufacturers for all kinds of Worsted Machinery and Supplies.

Change Gears and Parts for above Machinery kept in stock and a general line of Mill Supplies. Second hand Woolen and Worsted Machinery always on hand.

SPECIALTY—Worsted Machinery repaired and rebuilt with the latest improvements or altered as desired. Mill and Machinery Valuers.

Machine Shop, Farley St., So. Lawrence, Mass.

T. C. Entwistle Co.

Lowell, Mass.

Frank B. Kenney, Manager

Warping Machinery We make a special warper for fine yarns, with very sensitive stop motion and slack thread wires.

Beaming Machine for long or short, single or double chains. Will take any length beam, has extension and swing comb. Measuring clock attached if desired.

Long Grinder for Revolving Flats.

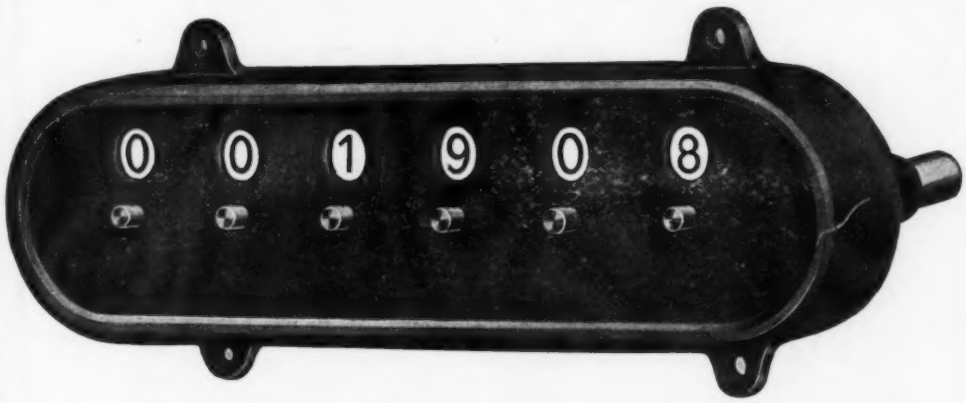
Traverse Wheel Card Grinder.

Card Grinders that grind accurately to thousandth of an inch, For American and English cotton, woolen and worsted cards. Traverse and long roll grinders.

Balling Machines that take 810 threads or less, has thread stop motion, double or triple trumpet screws for 1, 2 or 3 balls made at the same time.

Long Chain Dyeing Machines to be attached to dye tub, will take short chain also.

Full details of above machines will be gladly furnished.



INFALLIBLE COUNT

The Lineal Counter made by the C. J. Root Co., represents the highest development in counting machines.

Its salient feature is simplicity. It has few parts, no springs, is positive in action, cannot jump, and can be operated by rotary or reciprocating connection.

It can be arranged to count number of pieces, yards, or picks woven, and thus forms an equitable basis for paying operatives, without possibility of error. If desired can be furnished with a lock.

It can also be arranged to count the number of hanks of roving or yarn, the number of yards of cloth perched, the production of driers and scutchers, hookers, folders, printing machines, and in many other textile processes.

Those who have counting problems on hand are invited to correspond with the manufacturer.

C. J. ROOT COMPANY

Bristol, Conn.

C. & K. Dobbies

are best adapted to every requirement — always the leaders in efficiency and economy.

We apply them to any and all makes of looms.

Crompton & Knowles Loom Works

Worcester Providence Philadelphia

LAWSONS

Hope Foundry, LEEDS, England

BRANCH OF

Fairbairn Lawson Combe Barbour, Ltd.

MAKERS OF MACHINERY FOR

Preparing and Spinning

Flax, Hemp, Tow and Jute

Special Machinery for the Manufacture of Twines, Rope Yarns and Binder Twine

Good's Combined Hackling and Spreading Machine.

Long Reach Screw-Gill Drawing Frames. Chain-Gill Drawing Frames with Apron Heads.

Patent High-Speed Horizontal and Automatic Spinning Frames for Manila.

Improved Laying Machines.

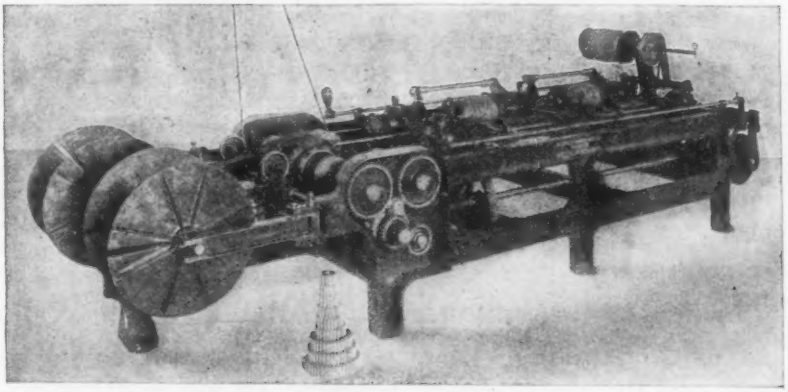
Haskell-Dawes Tubing Twisters.

Brownell's Patent Twisting and Laying Machines for Twine.

N. B.—Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

The Haskell-Dawes Machine Co.

176 Federal Street., Boston, Mass. Works: Frankford Junction, Philadelphia



Spinning, Forming, Twisting and Laying Machinery.

We build the Very best type of

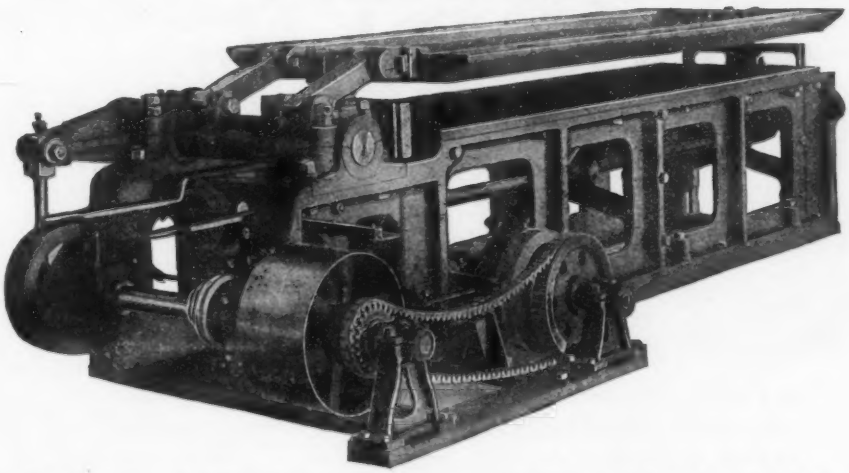
Modern, High Speed, Geared Machines

For Making Cotton, Flax, Jute and Manila Rope and Twine.

AGENTS SAMUEL LAWSON'S SONS' JUTE AND FLAX MACHINERY.

Farrel Foundry & Machine Co.

ANSONIA, CONN.



SINGLE AND DOUBLE FELT HARDENERS.

Chilled and Soft Iron Rolls. Heavy Transmission Machinery.

Machine Molded and Machine Cut Gearing, to 20 ft. diameter, Etc., Etc.

Heavy Castings, in Gray Iron or Semi Steel.

Darrow-Mann Company

New River Consolidated Coal & Coke Co.'s

New River Coal

Nonpareil Bituminous . . All Rail and Tide Water
Gas Coal and Gas Slack . All Rail and Tide Water
Nos. One, Two and Three, Buckwheat

30 Kilby Street, - Boston, Mass.

There's "Pulley Perfection" in Philips Pressed Steel Pulleys.

We told you about the Crown last month; this month we want You To Know the Hub and its Superior Points. It is light in weight, like all **Philips Pulleys,** and Elastic, so that it grips the shaft when you tighten the bolts—you need no shims or keys.

The **Philips** Hub always sits true, therefore, the **Philips Pulley** runs true and Never Wobbles, no matter how crooked the belt may be.

There are a lot of good points in those Few Words—read 'em again carefully—and Lots more to come.

OR, you can get them All At Once in our FREE BOOKLET. Send for it.

PHILIPS PRESSED STEEL PULLEY WORKS

Fourth and Glenwood **PHILADELPHIA, PA., U. S. A.**

6% of Noils Saved

by the use of

75% Olive Oleine

A guaranteed saving of 6 per cent of noils can be made over the use of lard or similar oil by using our **75 per cent Olive Oleine.**

It is not a viscous oil that causes trouble every time the temperature drops, and its use will enable the mill to start its cards or combs as easily Monday morning as any other.

This Oleine is a known quantity of standard worth. It hasbeen used by Yorkshire, (England) worsted mills spinning 60s and under for years.

Being distilled on a fixed formula it is always the same. Every batch oiled with it will run equally well.

Distilled wool grease oleines are **"The Natural Wool Oils."**

Samples and prices on request.

H. G. McKerrow Company, Ltd.

88 Broad Street, Boston, Mass.

Make Your Own Bleach Out of Salt Water

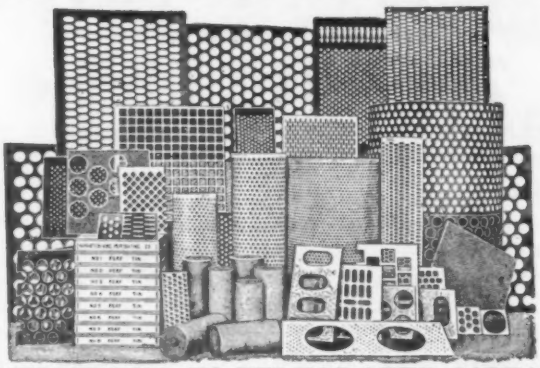
We can supply the Knitting Mill trade with an Electrolyzer for the production of bleaching liquor out of ordinary salt water by means of an electrical current, at a very small cost compared with what it will do. Does away with chloride of lime entirely; reduces the amount of sour; no danger of tendering goods. Operates under direct current. Hundreds in use. Prices and full particulars on application.

The National Laundry Machinery Co.

Dayton, Ohio, U. S. A.

PERFORATED METALS FOR TEXTILE MILLS

Used in
Dye Tubs,
Rinse Boxes,
Strainer Bottoms,
Scouring Tanks,
Steam Boxes,
Wool Scouring
Plates.



Used in
Burr Pickers,
Grabbing Machines,
Dyeing Machines,
Extractor Baskets,
Steam Finishing
Machines.

EVERYTHING IN PERFORATED METAL

Perforated Brass and Copper for Wool Washing Machinery.
Perforated Steel (black or galvanized) for Dusters, Reels, Drying Floors,
False Bottoms, Drainers, etc., etc.

ALL SIZES OF STEEL SURFACING.

It has been our business for many years to meet every need in this line and we have both the experience and facilities to do it. As most of this work is made to order send complete specifications.

THE HARRINGTON & KING PERFORATING CO.,
230 North Union Street,
CHICAGO

New York Office, 114 Liberty Street.

The Taylor & Fenn Company

MACHINISTS AND FOUNDERS
Hartford, Conn., U. S. A.
Builders of a complete line of

Textile Machinery

FOR

Bleaching Kiers of all sizes for high and low pressure Centrifugal Pumps and Agitators, Washing and Squeezing Machines.

Dyeing Open and Rope Washers and Soapers, Padding Machines and Aniline Agers, Dye Jigs and Dyeing Machines.

Drying Tinned Iron and Copper Cylinders, Horizontal and Vertical, all sizes.

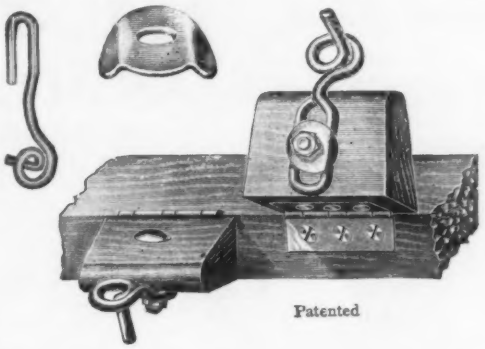
Finishing Mangles of all kinds, Calenders, Damping Machines, Belt Stretchers and Batchers.

Tentering Spring or Automatic Clips, Swing or Straight Frames, Patent Roller and Automatic Clips.

Indigo Dyeing, Aniline and Mercerizing Plants

Agents: ALEXANDER & GARSED, Charlotte, N. C.

The accompanying illustration shows the **Palmer** adjustable thread guide for spinning and twisting. This guide is **Adjustable** in all directions and can be rigidly and permanently fixed. **Thread** boards and rails of metal which are expensive are not necessary with this **Guide**



Patented

SEND two clappers for free samples for circular.

The Palmer Revolving Guide for Wet and Dry Twisting

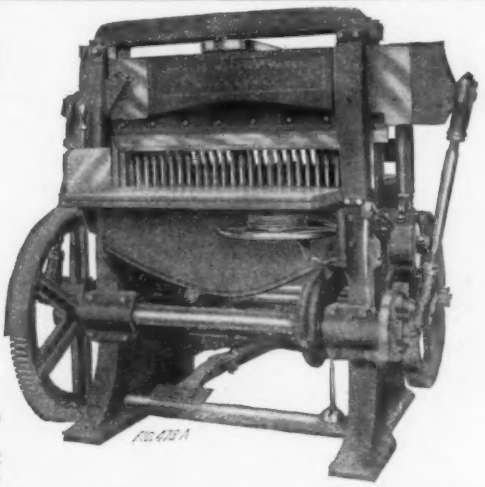
Patented

Lays the fiber closer
Makes a smoother twist
Saves power
Will outwear many wire guides

THE I. E. PALMER CO., Middletown, Conn.

Pinking Cloth and Cutting Samples on Oswego Cutting Machines

is easy, quick, economical and correct.



The attractive samples that can be cut on Oswego Cutters bring business. Ninety sizes and styles of Oswego and Brown & Carver Cutters are made. One of these is exactly suited to your present needs. A large number of these machines are in active operation cutting cloth.

Also Makers of Die Cutting Machinery.

Oswego Machine Works, Oswego, N. Y.

Niel Gray, Jr., Proprietor.

CRESSON

POWER TRANSMITTING MACHINERY

RING OILING HANGER
"PHILADELPHIA PATTERN"

Shafting Pulleys
Couplings Fly Wheels
Hangers Gears

Rope Driving a Specialty

Power Plants Designed and Equipped

Prices Right Shipments Prompt
Catalogs for the asking

CAST IRON
SPLIT PULLEY

GEO. V. CRESSON CO.

ENGINEERS FOUNDERS MACHINISTS

PHILADELPHIA, PA.
Allegheny Ave., West of 17th St.

NEW YORK CITY
90 West Street

Drives at a Right Angle

without noise, dirt or trouble.

Almond Rt. Angle Transmission

eliminates mule pulley stand and bevel gear troubles.

T. R. ALMOND MFG. CO.,
Ashburnham, Mass.
New York Office, 40 Murray Street

Robert G. Pratt

Worcester, Mass.

Battens and Supplies

Narrow Fabric Looms

for

The Proper Care of Belts.

This is the title of a little booklet telling how to preserve all belts and prevent slipping. Write for free copy and mention this paper.

Joseph Dixon Crucible Co.,
Jersey City, N. J.

KILBURN, LINCOLN & CO.,

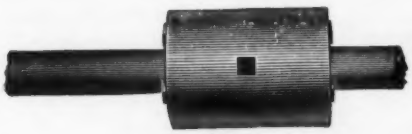
FALL RIVER, MASS.

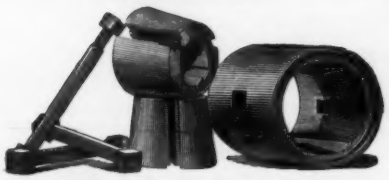
MAKERS OF

LOOMS

For PLAIN and FANCY WEAVING.

Represented in the South by
O. A. ROBBINS, - - - CHARLOTTE, N. C.





THE "SELLERS" MAKE OF

DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

PHILADELPHIA, PA.

Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

MACHINE TOOLS.
INJECTORS. POWER CRANES.

Patented in the United States and Foreign Countries.

"If you want the best specify the

American Wrought Steel Split Pulley

with rim of one layer of metal, grooved in center, stiffened by internal central flanges, and rolled beads on edges, six duplex steel arms, radiating from a steel hub and without rivets between hub and rim. More than 1,000,000 in use giving entire satisfaction. Sold by Supply Houses everywhere."

Send for Booklet.

The American Pulley Company

29th and Bristol Sts., Philadelphia, Pa.

ONEIDA

STEEL PULLEYS WILL SOLVE YOUR PULLEY PROBLEM FOR ALL TIME.

NOTICE THE DESIGN AND CONSTRUCTION.

MADE IN WIDEST RANGE OF SIZES OF ANY STEEL PULLEY IN THE WORLD.
DIAM.—6 TO 104 IN.
FACE.—3 TO 40 IN.
BORE—1 TO 8 IN.

Oneida Steel Pulley Co.,
Oneida, N. Y.

THEY ARE BUILT TO FILL ALL CONDITIONS OF SERVICE AND EXCEL IN DURABILITY AND EFFICIENCY. THEY ARE LIGHT, STRONG AND ARE PERFECTLY RIGID.

SOLD BY MILL SUPPLY HOUSES EVERYWHERE SEND FOR OUR LATEST CATALOG AND DESCRIPTIVE MATTER SHOWING CONSTRUCTION ALSO ILLUSTRATIONS OF LARGE SIZES.

WM. FIRTH, Pres. EDWIN BARNES, Vice-Pres. JOHN H. NELSON, Treas.

WILLIAM FIRTH CO.

Post Office Square Building 79 Milk Street, BOSTON, MASS.

SOLE IMPORTERS OF

ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

SOLE AGENTS FOR

JOSEPH STUBBS, Gassing, Winding and Reeling Machinery for Cotton, Worsted and Silk

GEO. HATTERSLEY & SONS, LTD. Makers of every Description of Looms, etc

JAMES MACKIE & SONS, LTD., Makers of Flax, Tow, Hemp and Jute Preparing and Spinning Machinery.

GEORGE ORME & CO'S Patent Hank Indicators, etc.

JAMES YATES & SON, Hardened and Tempered Steel Card Clothing for Woolen and Worsted Cards.

LOCKETT, CROSSLAND & CO., Engravers and Builders of Leather Embossing Machinery, etc., etc.

R. CENTNER FILS, Heddles.

GOODBRAND & CO., Yarn Testing Machinery, Wrap Reels, etc.

JOSHUA KERSHAW & SON, Roller Skins, etc.

GEORGE SMITH, Doffer Combs, etc.

BRADFORD STEEL PIN CO., Comber Pins.

CLAPHAM, SMITH & CO., Caps, Tubes and Spindles for Worsted, etc.

ALSO AGENTS FOR

JOSEPH SYKES BROS., Hardened and Tempered Steel Card Clothing for Cotton.

WILLIAM TATHAM & CO., Waste Machinery.

DRONSFIELD BROS., Limited, Emery Wheel Grinders. Emery Fillet and Flat Grinding Machines.

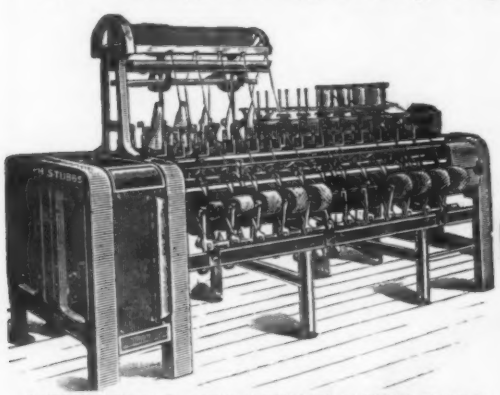
COTTON CORD AND VELVET CUTTING MACHINE CO., Corduroy Cutting Machines, etc.

PICK GLASSES, LEATHER APRONS, PATENT WIRE CHAIN APRONS.

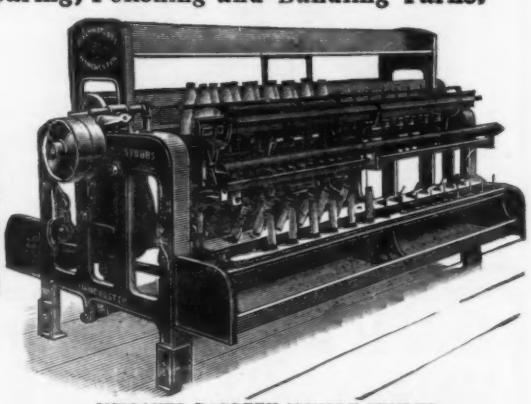
JOSEPH STUBBS - - Manchester, England.

SPECIAL MACHINERY

For Winding, Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

Sole Agents for the United States and Canada.

WILLIAM FIRTH COMPANY, Post Office Square Bldg., 79 Milk St., BOSTON, MASS.

DOBBIN'S ELECTRIC SOAP, ABSOLUTELY PURE AND UNIFORM.

Dobbins' Hard Water Soap, a Specific for Hard Water or Water Charged with Chemicals.

AMMONIATED POTASH SALTS FOR SCOURING.

Dobbins' Palm Oil Fulling Soap. Dobbins' "Fast Black" Soap. Pure Olive Oil Potash Soaps.

FREE SAMPLE SENT FOR TRIAL ON REQUEST.

DOBBINS SOAP MANUFACTURING CO., 119 SOUTH FOURTH STREET, PHILADELPHIA, PENN.

WILLIAM FIRTH, Pres. THE FRANK B. COMINS, Vice-Pres. and Treas.

AMERICAN MOISTENING COMPANY

79 Milk Street, Boston, Mass.

Received the HIGHEST AWARD on recommendation of the FRANKLIN INSTITUTE for

"Simplicity and Originality of Design."

Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARD in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

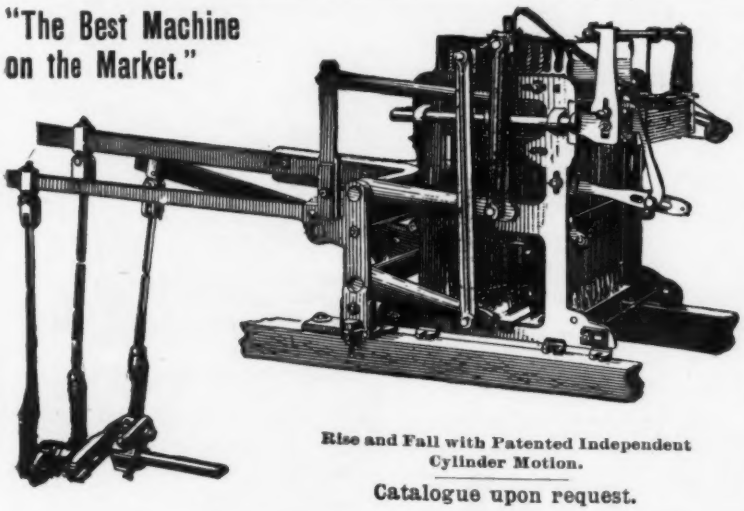
The Only Perfect System of Air Moistening

Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for booklet "T" on Humidification. Legal proceedings will at once be taken against infringers and users of infringements.

J. S. COTHRAN, Southern Representative, Trust Bldg., **CHARLOTTE, N. C.**

"The Best Machine on the Market."



Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

USE THE

HALTON JACQUARD

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder,

THOMAS HALTON'S SONS,

Allegheny Avenue and C Street,

PHILADELPHIA

Representative
H. A. Forbes, Paterson, N. J.

Crabbing, Steam Finishing, Opening and Folding, Tacking, Sewing, Squeezing Machines

BIRCH BROTHERS, SOMERVILLE, MASS.

ALBERT BIRCH, TEXTILE MECHANICIAN

Bleaching and Napping Machinery

Breton Oils

For wool are of definite and uniform quality. Over quarter of a century of hard work and constant attention to details has brought and keeps Breton Oils at the front. A grade for every requirement. Trial barrel on approval.

BORNE, SCRMYSER & COMPANY, 80 South Street, New York
Boston Fall River Philadelphia Works, Claremont, N. J.

LANE CANVAS MILL TRUCKS

Boxes and Baskets

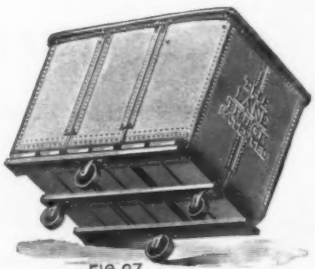


FIG. 27
Mounted on stationary iron frame wheels, as shown, or on swivel anti-friction casters.

Have established a reputation for strength, durability and economy.

Made in all sizes to suit all requirements.

Prices quoted on application.

FIG 50
Mounted as shown above, or tilting, like Fig. 27, if preferred.

W. T. LANE & BROTHER, Manufacturers, Poughkeepsie, N. Y.

JACKSON BELT LACER

Broad or narrow, heavy or light;
It's all the same, we lace them tight.

A Jackson Belt Lacer is the acme of time saving perfection because **one** man can carry the Lacer to the work and Lace the belt right on the spot in less time than it takes to tell.

AND after the joint is made, it stays; again you save time—by never having to repair that same joint.

Just because it's strong, don't think it's stiff; it's as flexible and flat as the rest of the belt.

Birdsboro Steel Foundry and Machine Co.
Birdsboro, Pennsylvania

Made by

Rodney Hunt Machine Co.

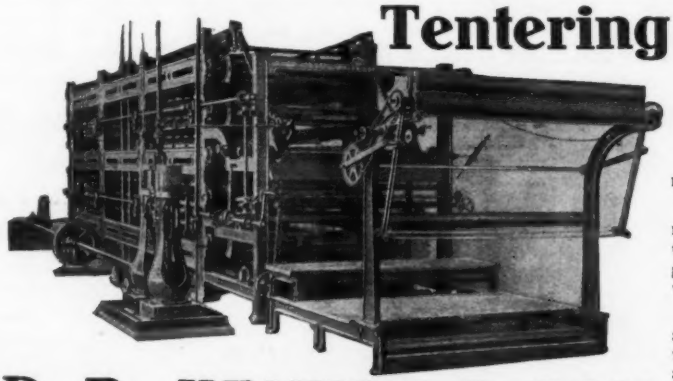
Boston Office, 70 Kilby St.

Works at Orange, Mass.

Send for Circulars

See Advt. of Water Turbines on page 286

Improved Fulling Mills Washers & Dyeing Machines



Tentering and Drying Machine

The cut represents one of our largest machines of the pipe system.

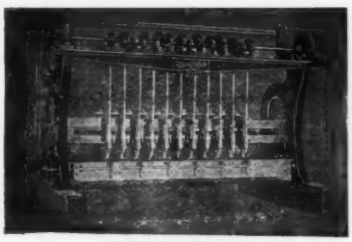
The wet goods in transit through the machine are thoroughly dried and tentered to the proper width. Although goods entering may be of various widths, all delivered are uniform.

The machine uses but a small amount of steam, and being substantially constructed, the repair bill is almost a negligent quantity.

It is equally efficient for heavy as well as light goods, either wide or narrow.

D. R. KENYON & SON

Raritan, New Jersey



50-IN. MACHINE

L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING MACHINES

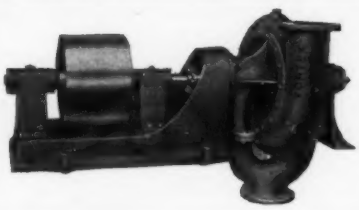
FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES

DESIGNER OF SPECIAL MACHINERY

WALPOLE, MASS. U. S. A.

PAPER SLITTING MACHINES



Centrifugal Pumps

We build them in accordance with the most advanced practice for all requirements. Consult with us on any pumping proposition.

Lawrence Pump and Engine Company

P. O. Box 70. Lawrence, Mass.

Catalogue T. R. now ready.

WILSON & CO., BARNSLEY, Limited

Absolutely secure combination of Shield and Bobbin guaranteed.

Loose Shields impossible.

BARNSLEY, ENGLAND.

Specialties: PATENT "LOCKFAST" and "CLIMAX" Shields. ENAMELLED CONDITIONING BOBBINS, Impervious to Steam, Moisture or Oil.

TRADE MARK.

GOLD MEDAL St. Louis, 1904. DIPLOMA d'Honneur Liege, 1905. Highest Awards for Bobbins.

Added Strength and Absolute Security.

Samples and Prices on Application.

SPEED & STEPHENSON, Agents for U. S., 170 Summer St., Boston, Mass.

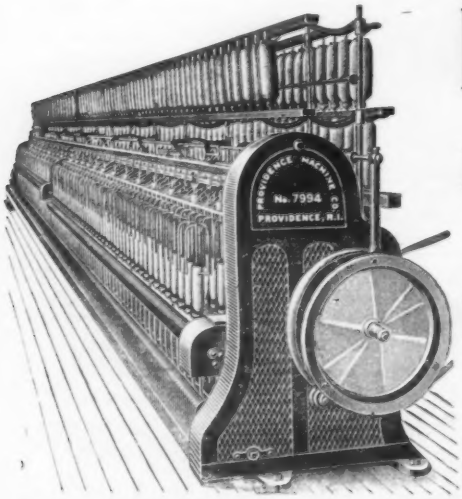
WILLIAM BODDEN & SON, Limited

The "BODDEN" Flyer

For QUALITY OF FINISH
For QUANTITY of PRODUCTION
HAS STOOD THE TEST OF YEARS

Sole Agents for U. S. A.

Thomas Mayor & Son, Olney Street, Providence, R. I.



Providence Machine Co.

Manufacturers of

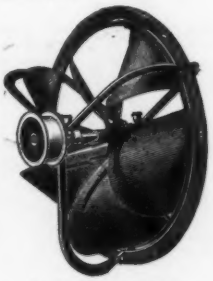
Improved Cotton Roving Frames

Improved Worsted Roving Frames

564 Eddy St., - - PROVIDENCE, R. I.

There is no better way
of
VENTILATING
than by using
THE BERRY WHEEL

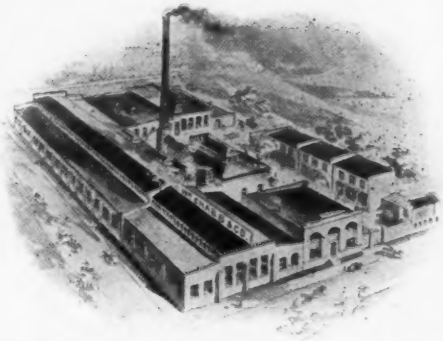
This is our Berry Wheel the most effective agent for drying, eliminating steam and other impurities in the atmosphere.



A. HUN BERRY,
23 West First Street,
BOSTON.

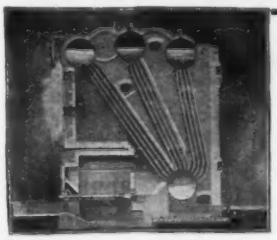
WILLIAM CRABB & CO.

Bagging Loom Reeds
Cotton Banding
Card Clothing in Leather
Card Clothing in Wood
Card Pins
Circles
Comber Needles
Comb Pins
Drawing Frame Pins
Fallers
Feed Rollers in Brass Shells
Gill Brass



Gills and Gill Bars
Hackles
Hackle Pins
Jennie Pins
Needle Pointed Pins
Picker Teeth
Porcupines
Rivets
Rotary Gills
Spreader Pins
Steel Springs
Steel Wire
Tentering Pins
Waste Machine Clothing and Teeth
Weavers' Combs

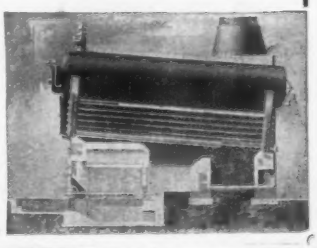
NEWARK, N. J.



The Murphy Automatic Smokeless Furnace

Burns Slack with Great Economy

The Murphy can be installed under any type of fire-tube or water-tube boiler and to units of any size.

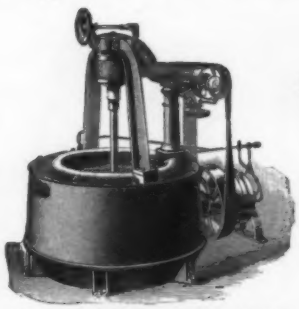


SETTING UNDER TWO TYPES OF BOILERS SHOWN HEREWITH

MURPHY IRON WORKS

DETROIT, MICH.

Hydro-Extractors, Exhaust Fans, Dye Tanks and Tubs

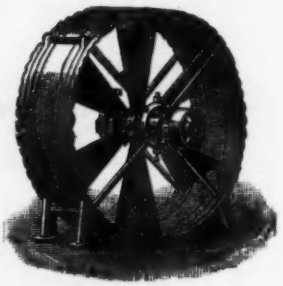


Adjusts itself to an uneven load, runs without vibration
Unusual capacity for high-class work

Bridger Hydraulic Cutting Press

Send for Catalog

Tolhurst Machine Works
Fulton St., and 6th Ave., Troy, N. Y.

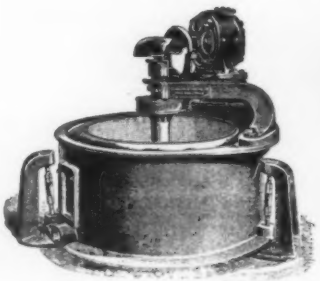


Moves more air than any other fan made. Very efficient under widely varying conditions. Noiseless and does not obstruct the light

SCHAUM & UHLINGER, INC.

PHILADELPHIA

MANUFACTURERS OF



HYDRO EXTRACTORS

Electric, engine and belt driven

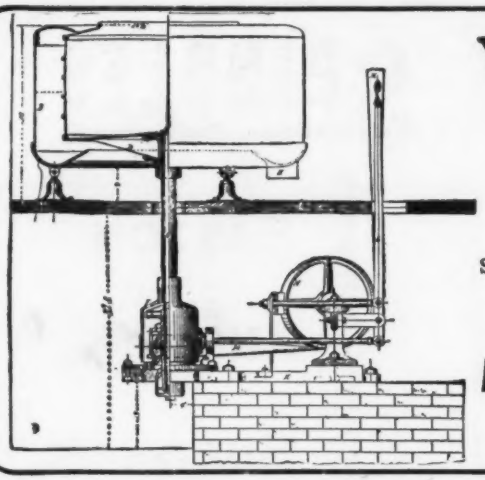
ASK FOR BOOK GIVING FULL PARTICULARS

K-A Electrical Warp Stop

IS ACTIVE AND UP TO DATE

SUBSTANTIAL EQUIPMENTS NOW IN PROCESS.
REPEAT ORDERS ARE ENDORSEMENTS OF MERIT.
COMPARISON WITH OTHER WARP STOPS INVITED.
K-A STANDS FOR CERTAINTY—SAFETY—SAVING.

K-A Dept. Mossberg Wrench Company
Central Falls, R. I.



Weston Hydro Extractors.

Special Machines for Acid Work.

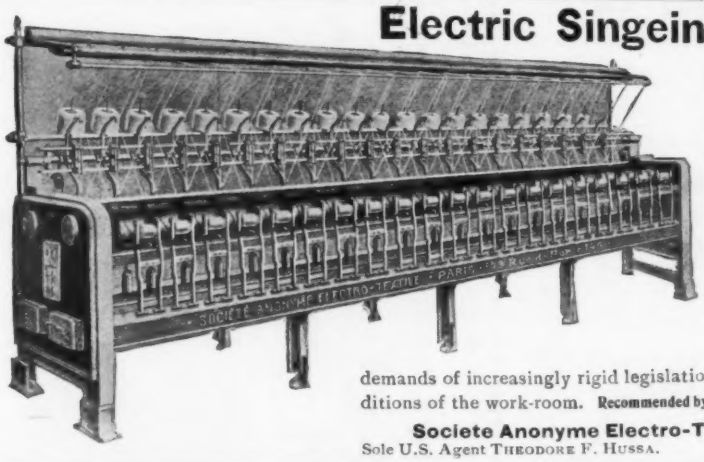
SHAFTING, PULLEYS,
FRICTION CLUTCHES, Etc.

American Tool and Machine Co.

Incorporated 1864. Founded 1845.

109 Beach Street, Boston, Mass.

Electric Singeing Machinery



for Cotton Yarns, Worsted, Silk, Schappe, etc.

We lower your cost of production from 30 to 60%.
We produce yarns of finer quality.
We produce yarns of better color.
We give you cleaner, safer work-rooms.
Simple to operate.
The only machine that allows manufacturers to meet the demands of increasingly rigid legislation controlling the health conditions of the work-room. Recommended by the Commissioners of Labor in France.

Societe Anonyme Electro-Textile, Paris, France.
Sole U.S. Agent THEODORE F. HUSSA. 136 Liberty St., New York City.

Electrical Installations

In Textile Mills is Our Specialty

15 Years Experience Highest References

MODERN LIGHTING SYSTEMS
EFFICIENT POWER PLANTS
RECONSTRUCTION OF OLD PLANTS

Watson-Flagg Engineering Company
Contracting Engineers
Paterson, N. J. New York, N. Y.

Harness Skips

EVERY woolen superintendent and boss weaver knows how often imperfect cloth results from a harness skip caused by a jack or harness strap breaking. Some times a yard or more of cloth is woven before the break is detected, especially if the weaver is running more than one loom. That means seconds and allowances.

Our simple and very inexpensive attachment prevents all that. It stops the loom instantly and automatically whenever a jack, harness wire or strap breaks. It is not one of those fussy devices which lumbers up a loom and causes the fixer and weaver a lot of additional trouble.

One of the most up-to-date concerns has had fifty of these devices on their looms for a considerable time and have recently ordered fifty more for another mill. Several of their neighbors having learned how well it works have placed orders.

Send for circular.

Bamford & Smith Company

Providence, R. I.

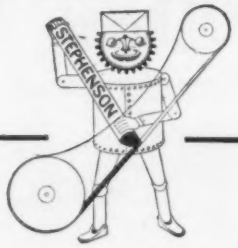
SPINDLES

EASTON AND BURNHAM MACHINE CO.

PAWTUCKET, R. I.

REPAIRS FOR RABBETH SPINDLES

"The After Effects Are Pleasant."



If Quality Counts

and ***Results*** are what you want, refuse to accept a cheap substitute, and insist that your Dealer gives you the kind of ***STEPHENSON Bar Belt Dressing*** that is made for your particular belts. Be sure the ***Man with the Cog-Wheel Face is on each Pound Stick.*** And don't confuse the Brands.

RED Label Brand for Leather Belts
GREEN Label Brand for Rubber Belts

Stephenson Mfg. Co., Albany, N.Y.

Write for sample of STEPHENSON Belt Cleaner.

Cooper Hewitt Lamps

FOR TEXTILE MILLS

The threads are more clearly seen than by daylight

This has been the universal experience of textile workers in mills illuminated by Cooper Hewitt Lamps. The light has a peculiar magnifying or clarifying quality. This quality is useful both in weaving and finishing, even where a great variety of colors are handled. Our Leaflet No. 60 "Better Than Daylight," gives some interesting and valuable data.—You should read it.

COOPER HEWITT ELECTRIC CO.
220 West 29th St., New York.

WATER TOWERS
IRON OR STEEL

for Fire Protection and Domestic Service.

Built in all sizes.

Write for catalogue.

Plans and prices cheerfully given.

Tippett & Wood, Phillipsburg, New Jersey

TANKS and VATS

Cedar, Cypress and Pine

For Dyers, Bleachers, Tanneries and General Factory Purposes.

Reservoir Tanks
Sprinkler Tanks
Special Tubs and Vats

Steel Towers

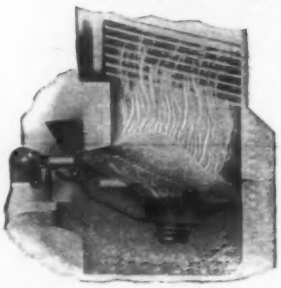
For Elevating Tanks to any Height.

New England Tank and Tower Co.
112 High Street, Boston, Mass.

Taylor Stoker

100% OVERLOAD
50% SAVING IN LABOR
25% SAVING IN FUEL

Smokeless in Operation



The reason why the "Taylor" can produce better results than any other furnace or stoker is because the "Taylor System" means absolute control of the essential elements of combustion — coal and air.

American Ship Windlass Co.
General Sales Office and Works
PROVIDENCE, R. I.

LENHER ENGINEERING CO.
Sole Agents, N. Y., N. J., Pa.
Singer Tower, 15-3 **New York City**

"NO WASTE"

Is the name of the only

Seamless Hard Fibre Roving Can

MADE FROM PURE CHEMICAL HARD FIBRE

NO SEAMS or RIVETS

Absolutely Smooth

No Waste or Broken Ends

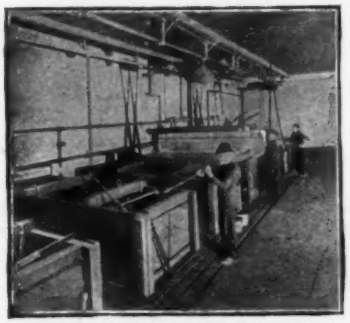
Write for prices.

MANUFACTURED BY THE

Standard Fibre Co.
SOMERVILLE, MASS.

Waters' Dyeing Machine

This cut shows a new and useful machine patented by D. F. Waters for the dyeing of any color on Worsted, Woolen, Cotton and Merino Yarns.



Being successfully operated by some of the largest manufacturers in the country.
The saving of labor will more than pay for a machine in a few months.
Capacity; 2,000 lbs. a day per man.
Machine can be seen in operation at any time at my plant where I have 13 in operation all the time.

D. F. WATERS,
54 and 55 Wister St., GERMANTOWN,
PHILADELPHIA, PA.

We have the Largest Exclusive Spool Manufacturing Plant in the World with a capacity of 10,000 High Grade Bushed Spools per day.

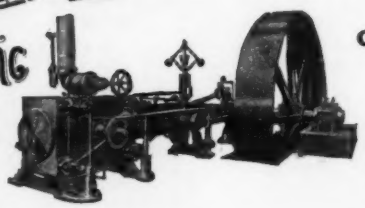
Our splendid facilities guarantee prompt and immediate deliveries. Our equipment, than which no better exists, guarantees the highest grade of all hard wood spools of the highest quality procurable at medium prices.

COTTON WARPER SPOOLS, COTTON TWISTER SPOOLS, WORSTED ROVE SPOOLS, CARPET CREEL SPOOLS, WORSTED REDUCER SPOOLS, WOOL WARP SPOOLS.

We can give one week deliveries on any order of the above kinds of spools.

Lestershire Spool & Manufacturing Co.,
LESTERSHIRE, N. Y.

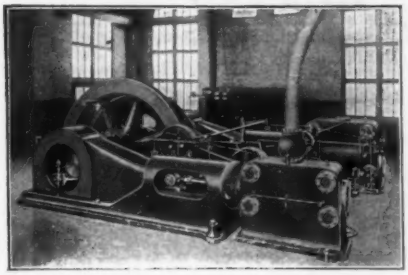
THE IMPROVED FISHKILL CORLISS ENGINE
BUILT BY THE FISHKILL LANDING MACHINE CO.
FISHKILL ON HUDSON N.Y.



For all power purposes
where high economy and
close regulation is required.

Cylinders & Valve Chests rebored in place.

General engine repairs.



Rice & Sargent Corliss Engines
Heavy Duty Type
NOTED FOR
RELIABLE SERVICE,
LOW STEAM CONSUMPTION,
LOW FRICTION LOSSES and
SPEEDS HIGHER THAN OTHER CORLISS TYPES.
Designed and built by
PROVIDENCE ENGINEERING WORKS
Main Office & Works PROVIDENCE, R. I.

There are many articles advertised to do the work of
Carbolineum—but have you ever tried
AVENARIUS CARBOLINEUM
"It preserves wood against rot."
On the market since 1875.
Carbolineum Wood Preserving Co.
347 West Broadway, New York, N. Y.

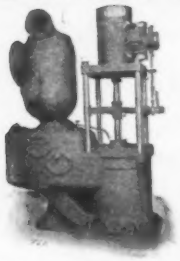
THE PROOF OF THE PUDDING IS IN THE EATING.

The Best That Money Can Buy
SPINNING RINGS.
TWISTER RINGS.
RING HOLDERS.
TRAVELER CUPS.
SILK RINGS.
TRAVELER CLEANERS.
Correspondence Solicited.
WHITINSVILLE SPINNING RING CO.,
WHITINSVILLE, MASS., U. S. A.

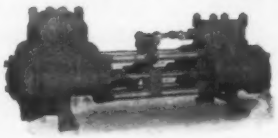
DEAN BROS. STEAM PUMP WORKS

INDIANAPOLIS, IND.

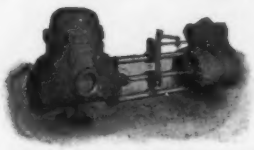
DUPLEX PUMPS, SIMPLE PUMPS
ATLANTIC BOILER FEEDERS
JET AND SURFACE **CONDENSERS** ELECTRIC PUMPS BELTED PUMPS, Etc.



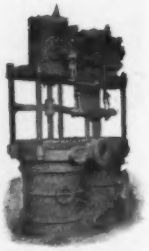
VERTICAL AIR PUMP AND JET CONDENSER



DUPLEX DURABLE PUMP



SIMPLE PUMP



TWIN AIR PUMP AND CONDENSER

OIL-STEAMPROOF "Aqua" WATERPROOF

AQUA Waterproof Belting

FOR TEXTILE MILLS

If steam or moisture makes your belts stretch beyond all reason, or if your belts slip and ruin because oil or water drips upon them, get a Shultz Aqua Waterproof Belt.

Aqua is waterproof, steamproof and acid-fume proof and it will outwear any rubber or canvas belt made.

Send for Booklet "6."

SHULTZ BELTING COMPANY
ST. LOUIS, MO.

NEW YORK 111 Chambers St. | BOSTON 114 High Street | PHILADELPHIA 116 N. 3rd St.

THE

Bartlett Water Softening System

Assures a Uniformly Softened Water

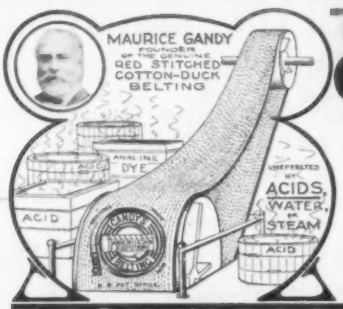
FOR

Washing - Dyeing - Scouring
Bleaching and Boiler Feed

Our Systems are adapted to any variation in water supply
Cost reasonable
Cost of operation nominal.

Our Catalogue gives full information

Northern Water Softener Co.
Madison, Wisconsin.



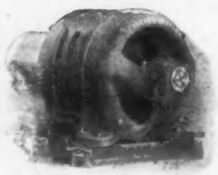
THE GENUINE GANDY

ANOTHER VICTORY.

On Nov. 18th, 1907, we secured a judgment against Weller Manufacturing Company for selling imitations.
On Feb. 5th, 1909, Circuit Court of U. S., Western, Dist of Pa., issued an injunction against C. A. Turner Inc., from infringing upon our rights.
GANDY TRADE MARKS are registered and will be protected, so don't be deceived. Every belt shows every ten feet "GENUINE GANDY BELT."

We also make Gandy Belt Dressing and issue a free Booklet, "Experiences with Gandy."

THE GANDY BELTING CO. BALTIMORE, MD.



The equipment of the Clark Thread Mills with **C-W** squirrel cage motors is a sign of the times.

Our bulletin 105 Y describes this motor.

Crocker-Wheeler Company, Ampere, N. J.

New Bedford Textile School

Day and Evening Instruction in

Picking,
Carding,
Combing,
Spinning,
Warp Preparation,
Weaving,
Designing,
Knitting,
Chemistry and Dyeing.

CATALOGUE ON APPLICATION.

Address

New Bedford Textile School
New Bedford, Mass.

Philadelphia Textile School

TWENTY-FOURTH YEAR

Oldest in America
Most Complete in the World

Endorsed by the Leading Educators and Manufacturers

Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing

Special Courses in Textile Chemistry and Dyeing

For illustrated Year Book and other information, address

E. W. France, Director,

Broad and Pine Streets - - - - - Philadelphia

JAMES H. CLARKE GEORGE B. COCKER

COCKER MACHINERY COMPANY

Improved Warping and Beaming Machinery

of all types for Cotton Textiles.

Improved Double Acting Nappers and Felters

For Cotton and Woolen Goods.

Frankford, Penna.

Established 1870

John Heathcote & Son

Providence, R. I.

Builders of Improved

Cloth Tentering and Drying Machinery

for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

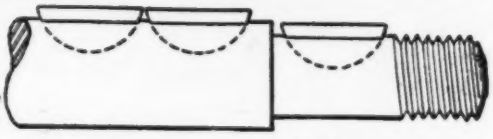
Ventilating Fans a Specialty

Send for Catalogue

Key Seating Attachment

FOR

Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,

19 Oak Street, New London, Conn.

All Space Occupied

Cases, bales and packages piled tier upon tier easily and quickly. The Economy Steel Tiering Machine will increase the capacity of your storage room, give instant accessibility to any of the goods, and decrease cost of handling.

Each Case In Place

Put there with ease and economy, it does away with the old laborious hand method. The Economy Steel Tiering Machine enables a small man to lift a large load and put it where he wants it.

Economy Engineering Co. 58-64 N. Jefferson St. Chicago, Ill

Get Your Supplies from the Manufacturers.

EXCELSIOR WOOL OIL COMPOUND AND COTTON SOFTENER

Established 1841

Burckhardt & Co.

Cincinnati, O.

The Excelsior Compounds are the best lubricating and softening products for wool, cotton, wool and cotton mixed. Eliminates the scouring process and effects large saving in time and soap. They will not gum in the cards.

Write for prices and particulars.

OLIVE OIL · TALLOW SOAP

LARD OIL

A. H. HOWARD, Pres. ESTABLISHED 1866. HERBERT MIDGLEY, Supt.

A practical test will convince you we can furnish the

BEST

COTTON, WOOLEN and WORSTED

CARD CLOTHING

Howard Bros. Mfg. Co.

144 and 146 Vine Street, WORCESTER, MASS.

To the Manufacturer who Invites Success!

THE HENDERSON CARD

will increase your carding and improve the quality of your yarn with less waste, greater strength and increased production over any other system.

James H. Whittle Co. 150 Harlow St., Worcester, Mass.

Successors to the Cleveland Machine Works

Owners and manufacturers of the celebrated **Henderson Card** for Wool, Worsted, Cotton, Waste, Flax and Asbestos. Also manufacturers of

All Kinds of Woolen Machinery.

Bates & Robinson

Patented Dec. 1908

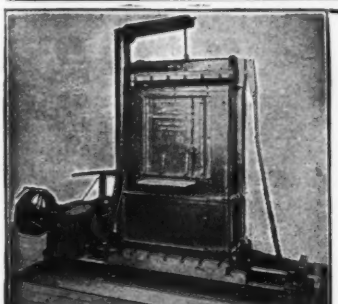
Combination Card Clothing

Which makes workers out of the strippers.

Thousands of these combination strippers running in the best mills in America.

Bates & Robinson Machine Co.

148 Warren Street, LOWELL, MASS.



Our Latest Improved Steel Power Press with New Steel Link Chains

Minnich Baling Press

for all kinds of products.

Must turn out more bales with less labor and power than any press in the market.

Send for circular.

Minnich Machine Works,

Lancaster Co. Landisville, Pa.

BLEACHING
DYEING
FINISHING
MACHINERY

ARLINGTON MACHINE WORKS
ARTHUR BIRCH
ARLINGTON HEIGHTS, MASS.

CRABBING
OPENING
SEWING
MACHINES

ESTABLISHED 1825

GEO. SIMS & SONS, Engineers
Sherwood Street, Nottingham, England
MAKERS OF IMPROVED

LACE DRESSING PLANT

Starch Rollers in Brass or Mahogany

LACE GASSING MACHINES, ETC.

E. B. BADGER & SONS CO.
Established 1841
COPPERSMITHS

STEAM JACKET KETTLES

Guaranteed to stand 150 lbs. cold-water test

Equal, if not Superior, to any in the market.

66 Pitts St.
BOSTON,
Mass.

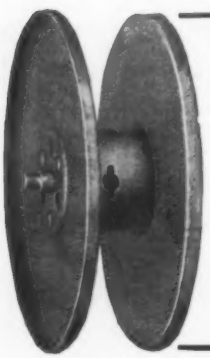
It Attracts Universal Attention Because it Is THE BEST

BADGER'S
Fire Extinguisher

Has taken the lead in the United States, and is everywhere recognized for its efficiency. After competitive tests, lasting more than one week, THE UNITED STATES GOVERNMENT placed an order for 1,200 of

BADGER'S The Latest and Most Approved Automatic, Chemical, Hand Fire Extinguisher Made

Badger Fire Extinguisher Co.
42 Portland St., Boston, Mass., U.S.A.



Economical Beams

Beam breakage in weave room, slasher room, etc., is usually quite an item. This expense can be done away with by using *Stamped Steel Beams* with *Steel Barrels*. These beams are unbreakable, light in weight, and moderate in cost. Flanges always run true, no wood to warp, crack or splinter. Send for catalog.

FRANK MOSSBERG CO.,
See our special Reel, Spool and Beam Catalog. **Attleboro, Mass.**

ENTWISTLE WARPERS

T. C. Entwistle Company

LOWELL, MASS.

FRANK B. KENNEY, Manager

Southern Agent:
STUART W. CRAMER, Charlotte, N. C.

The Metallic Drawing Roll Co.

INDIAN ORCHARD, MASS.

MANUFACTURERS OF

Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

WRITE FOR PARTICULARS.

JACOB WALDER,
Paterson, N. J.

Sole Manufacturer in the United States of

Brass and Steel **MAILS**

Liberal Discount to Dealers.

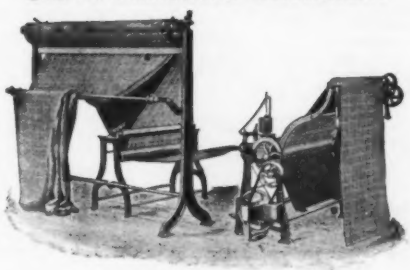
Built for Hard Service Hill's Dye House Cans

Our method of construction gives exceptional durability. Made from the best galvanized sheet iron—all rings riveted into can and then soldered. The bottom is locked on to the ring in a way to make it practically indestructible. Nothing like them for handling wet warps.

Send for booklet.

James Hill Mfg. Co.
Providence, R. I.

WOOL BURRING and PICKING MACHINERY
CLOTH FINISHING MACHINERY



DOUBLING AND TACKING MACHINE

Curtis & Marble Mch. Co.
WORCESTER, MASS.

We Challenge You

to find a bearing in your entire plant which Mica Flake Lubricant will not keep cool—or a hot bearing which Mica Flake Lubricant will not **cool while running!** Our challenge is contained in a **small package,** freely offered for demonstration purposes, of

MICA FLAKE LUBRICANT

Do you accept our challenge? Send for the test sample! **Mica Flake Lubricant is radically different, in principal and performance,** from Graphite or any other lubricting material.

Keeps the metal bearing surfaces actually apart—reduces friction—cools hot journals—lengthens the life of your oil—saves costly delays and break-downs—increases operative efficiency.

Mica Flake Lubricant is **pure Mica—pure white**—will not discolor or damage fabrics. **Write for literature prices, and the test sample!**

THE UNITED STATES MICA COMPANY, 238-240 LaSalle St., Chicago, U. S. A.

A Reliable Tie

For tying all kinds of bundles and bales. Simple, quick, sure. Cannot untie, yet instantly fastened and unfastened. Secures yarn, cloth, underwear, etc., when carried from dep't to dep't. An inexpensive, durable time saver. Sample on request.

The Reliable Tie Company
Chadwicks, New York.

Gilbert Wood Split Pulleys

SAGINAW MANUFACTURING COMPANY,
SAGINAW, MICH., U.S.A.

New York Branch, 88 Warren St.,
Chicago Branch, 28-32 So. Canal St.
Sales Agencies in all the Principal Cities.
Cable Address: Engrave. A B C and Lieber's Codes.

ELIAS T. VANDEGRIFT

Successor to Ward & Vandegrift

In the Manufacturing of **SPINDLES,**

For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

ELMER, SALEM CO., .. N. J.

A. G. THURSTON & SON,

MANUFACTURERS OF

Fluted Rolls, Pressers for Flyers

AND GENERAL MACHINERY

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened, Restepped and Retopped.

Box 528. FALL RIVER, MASS.

CASE BROTHERS

INCORPORATED

Highland Park, Conn.

Manufacturers of

RAG PRESS BOARDS

Especially Adapted to **Hot Pressing**

Also **Fender Boards**

Medals awarded at Paris and Melbourne Expositions.

Jacquard Cards

of all Grades for Fancy Weaving. Accurately Cut to Any Size.

R. H. HOOD COMPANY

Manufacturers of

Oak Tanned Belting

and

Worsted Aprons

General Mill Furnishers

1842-46 Germantown Ave., PHILADELPHIA, PA.

WILLIAM SCHOFIELD CO.

Krams Ave., formerly Church St., Manayunk, Phila., Pa.

Textile Machinery

Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.

Special Machinery Built. General Machinery Repairs.

Relagging Picker Cylinders a Specialty.

BELTED—STEAM—ELECTRIC

Hundreds in Service **HYDRO** Write for Circulars

EXTRACTORS

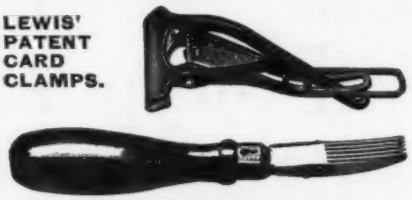
—THE KIND FOR HARD SERVICE—

DIENELT & EISENHARDT, Inc.

Howard and Thompson Sts.
PHILADELPHIA

CARDER'S TOOLS

LEWIS' PATENT CARD CLAMPS.

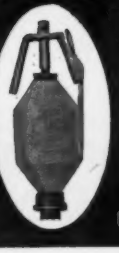


Gardner & Reid's Card Tooth Raiser

For setting up Bent Teeth of Card Clothing. Also a variety of other tools used by Carders and Manufacturers. Send for circular.

WM. H. BROWN CO. No. 81 Mechanic Street WORCESTER, MASS.

TEXTILE MACHINERY CO.



DUNN FLYER

60 INDIA ST.

BOSTON · · MASS.

Edward Jefferson & Brother,

SOLE AGENTS FOR

The Textile Machinery Association Ltd.

Leeds, England

MAKERS OF ALL CLASSES OF

Worsted Machinery

127 South Second St., Philadelphia, Pa.

COPPER

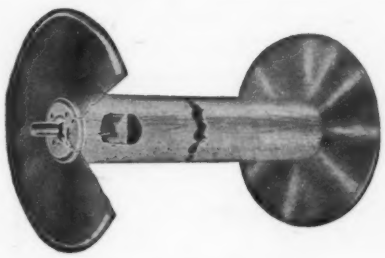
Printing Rollers
Singe Plates
and Sheets

Taunton-New Bedford Copper Co.

New Bedford, Mass.

Our Guarantee:

Superior Quality. *Prompt Shipments.*



S. & D. Jack Spool

Pat. Aug. 6th, 1906

SWEET & DOYLE, Mill Furnishers

COHOES, N. Y.

The only spool made that the barrel itself acts as a support for the head. Note the recess in the head and the shoulder on the barrel. Our Claim:— A perfectly SMOOTH HEAD.—NO SLIVERS.— A STIFF SPOOL.—The STRONGEST.—The LONGEST LIVED.—As CHEAP as the BEST.— Practically INDESTRUCTABLE.

Established 1844.

BENJ. BUCKLEY'S SON,

(WM. J. BUCKLEY) *Gun Mill, Paterson, N. J.*

Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

SILK MILL SUPPLIES

OF EVERY KIND AND DESCRIPTION

Also Power Transmission Supplies for General Mill Use.

I. A. HALL & CO.

Paterson, N. J.

Allentown Reed, Harness and Mill Supply Co., Allentown, Pa.

BALE-TIES and BUCKLES
BOX STRAPPING ALL STYLES

Samples and prices on application.

ACME STEEL GOODS CO.

Name changed from Acme Flexible Clasp Co.

NEW YORK, 28 Elm St. CHICAGO, 2832-40 Archer Ave.

ATLANTA, GA., Empire Bldg.

ANYTHING in Mill Supplies.

Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.,
PROVIDENCE, R. I.

Spindles
Flyers
Repairs
of all kinds

F. A. & P. HALL,
DOUBLING and SPOOLING MACHINES
LAWRENCE, MASS.

Caps
Tubes
Spinning
Machinery
Parts

Thread and Silk **SPOOLS** of any description

made from one piece, up to 6" long and 3" dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

E. L. TEBBETS SPOOL COMPANY, Locke's Mills, Me.

Steel Heddle Manufacturing Co.

2110-18 W. Allegheny Ave., Phila., Pa. Manufacturers of

STEEL HARNESS and FRAMES

Sole Selling Agents { For England, Ireland, Etc., Thomas E. Power & Co., Bradford, England
For Japan and China, Shewan Tomes & Co., 10-12 Broadway, N.Y. City

REVOLVING FLAT CARD BRUSHES

S. A. Felton & Son Co. FOR USE ON ALL MAKES OF REVOLVING FLAT CARDS **Manchester, N.H.**

ASHWORTH BROS.,

—MANUFACTURERS OF—

Card Clothing of Every Description

FALL RIVER, MASS.

Shaw's "Victor" Travelers

Manufactured by

VICTOR SHAW RING TRAVELER CO.

Incorporated 1899.

23 Sabin Street, PROVIDENCE, R. I.

L. E. BARNES, Pres. and Treas.

The E. E. Burnham Co.

252 Lowell St., Lawrence, Mass.

Manufacturers of

Leather Belting
Cotton and Worsted Roll Coverers

General Mill Supplies

85% Pure Magnesia Steam Pipe and Boiler Covering

Diehl Manufacturing Co.,

ELIZABETHPORT, N. J.

HIGH GRADE

Electrical Apparatus

A line of Slow Speed Motors Especially Adapted to Textile Work

Eureka Fire Hose

THE BEST FIRE HOSE MADE.

(Trade Mark.)

For use in

Cotton Mills, Woolen Mills and Factories.

Seamless Woven and Rubber lined EUREKA COTTON HOSE, has no equal. Send for circular and testimonials.

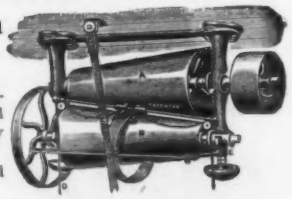
Awarded Gold Medal at the St. Louis Exposition, 1904.

EUREKA FIRE HOSE MFG. CO.

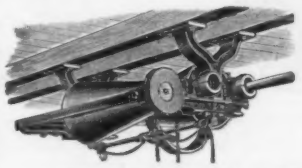
13 Barclay St., New York, N. Y.

Variable Speed Countershafts

The Evans Friction Cone Pulleys



will drive your machines at any desired speed from 1 to 6 by simply pulling a cord. They are guaranteed to do your work.



We'll furnish them for either floor or hanging use. Over Ten Thousand Sets in Operation in this Country and Europe. Send for Catalogue.

EVANS FRICTION CONE COMPANY

G. Frank Evans. - Newton Center, Mass.

BIRCH BROS.

Somerville, Mass.

"Coronation"

Piece End Sewing Machines

on American stand sent on trial most anywhere.

Send for Circular.

Bleaching, Dyeing and Finishing Machinery.

Sews any Fabric

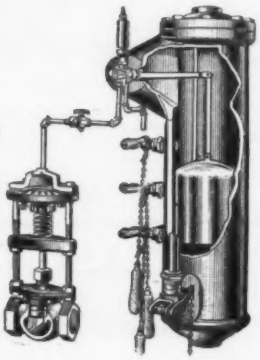
Thick or Thin Wet or Dry Without Change Fine Stitch or Coarse Stitch

The

Berry

Safety Automatic Feed Water

Regulator



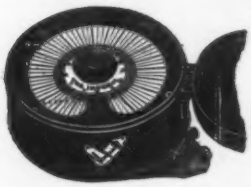
New England Office: 103 Bedford St., Boston, Mass.

Berry Engineering Co., Chester, Pa.

Dr. CHAS. F. McKENNA, Hudson Terminal, 50 Church St., New York City

Consulting Chemist and Chemical Engineer

Materials a Specialty. Processes—Economies—Inspection.



WATCH YOUR WATCHMAN

The Nanz Imperial Watchman's Clock

Compels your watchman to do his duty. This clock will reduce your insurance rate. No complicated mechanism. Absolutely reliable. Full particulars.

T. NANZ CLOCK CO., - - 178 Fulton Street, New York.

SAVE Their Cost In Freight.

THE CHAFFEE PATENT CLOTH BOARD,

Made of paper and wood,
Needs no covers.
Will not split or warp;
Not liable to break.

MFG. BY CHAFFEE BROTHERS COMPANY, OXFORD, MASS.

BOX SHOOKS and CLOTH BOARDS.

Clean LIGHT Strong

FOSTER SUPERHEATERS

Installed in any type of boiler without change in setting. Uniform superheat guaranteed.

Power Specialty Company,

BOSTON: 10 Post Office Square. **NEW YORK: 111 Broadway.**

DIXON PATENT STIRRUP ADJUSTING SADDLE

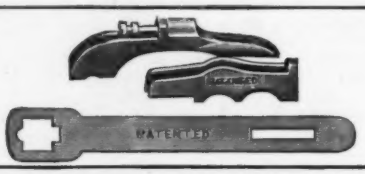
1,200,000 pairs now in use

Best Saddle for Top Rolls of Spinning Frames

Send for Samples

DIXON LUBRICATING SADDLE CO., Bristol, R. I.

Manufacturers of all kinds of Saddles, Stirrups and Levers



Telephone 989-3. W. U. Code Word—Adamsal

A. L. ADAMS,

MANUFACTURER OF PATENTED

CORSET AND FABRIC MACHINERY.

Strip Cutting, Folding and Winding Machines, Plain or Bias, 300 to 2400 Yards a Minute.

I personally, have introduced and taught people to do bias on my machines in seven countries. I furnish a complete equipment for cutting straight or bias fabric, and folding same.
Automatic Strip Cutting, Folding and Winding Machines in three variations. Universal Folding, Winding and Spooling Machines in three variations. 40-inch Winding and Cutting Machines. All of the seven machines for straight or bias fabric.
These machines pay for themselves in a short time. Any kind of a folder for any kind of fabric, bias or straight, 1-8 to 6 inch.

151 MIDDLE STREET, BRIDGEPORT, CONN.

MASON MANUFACTURING CO., Inc.

Makers of

Machinery for Braiding and Finishing Sash Cord.

15 1-2 Chardon Street BOSTON, MASS.

Sent Free

A complete catalog of all

Textile Books

OUR descriptive catalog contains a list of all the books in the English language on textile subjects that are in print and that are of present value, classified under the different subjects to which they pertain. This catalog should be in the possession of every mill man. It will be sent free upon application. New books on textile subjects are being published frequently. We can supply any textile or technical book, whether of our own publication or not, at lowest prices. We can also give information and prices of foreign textile publications, etc. We are headquarters for everything in the line of textile literature and information.

Lord & Nagle Co.

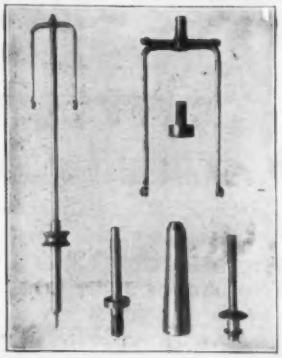
Boston, Mass.

Publishers of the

Textile World Record

Geo. W. Womelsdorf Frank T. Calder

Calder Machine Works



We Manufacture

Spindles
Flyers
Caps
Tubes

and all parts for Worsted and Silk Spinning.

Spindles and Flyers of every description promptly repaired.

325 Race St., Phila., Pa.

DINSMORE

Mill Sewing Machines

No. 9.—Portable Foot-Power Rotary Sewing Machine

It is especially adapted for use in Cotton and Woolen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,

Salem, Mass., U. S. A.

The Mercerizing Question

Is solved if you use the

Swiss System

No boiling or moistening.
No breaking of the thread and no streaks.
Better strength, elasticity, lustre and softer touch.
Largest production and lowest consumption of caustic lye.
Absolutely even dyeing in the most difficult shades.

The MERCERANINE PROCESS.
The Automatic Skein MERCERIZING MACHINE with progressive elastic attention.
The Evaporating-Apparatus for the Caustic Lye.
The SILK-FINISH LUSTERING Machine.
The cold air DRYING MACHINE for cross-spools, cops, bobbins and hosiery.

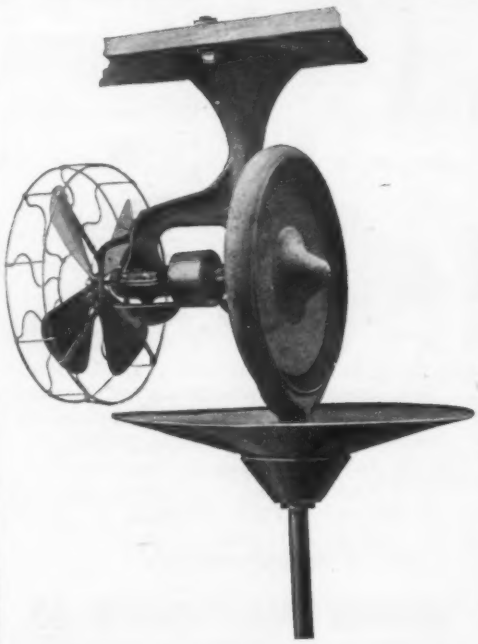
Swiss Textile Industry Company

Of BASEL, SWITZERLAND

Exclusive American Agent,

A. W. BUHLMANN, ENGINEER

487 Broadway Silk Exchange Building New York



Simplest Humidifier Made

The Hygrosso

Why bother with pressure pumps, float valves, water levels, strainers and other troublesome devices which complicate humifiers?

You have none of these to contend with when the HYGROSSO is installed—Its most simple in construction and operation, efficient and inexpensive to operate.

Correspondence invited.

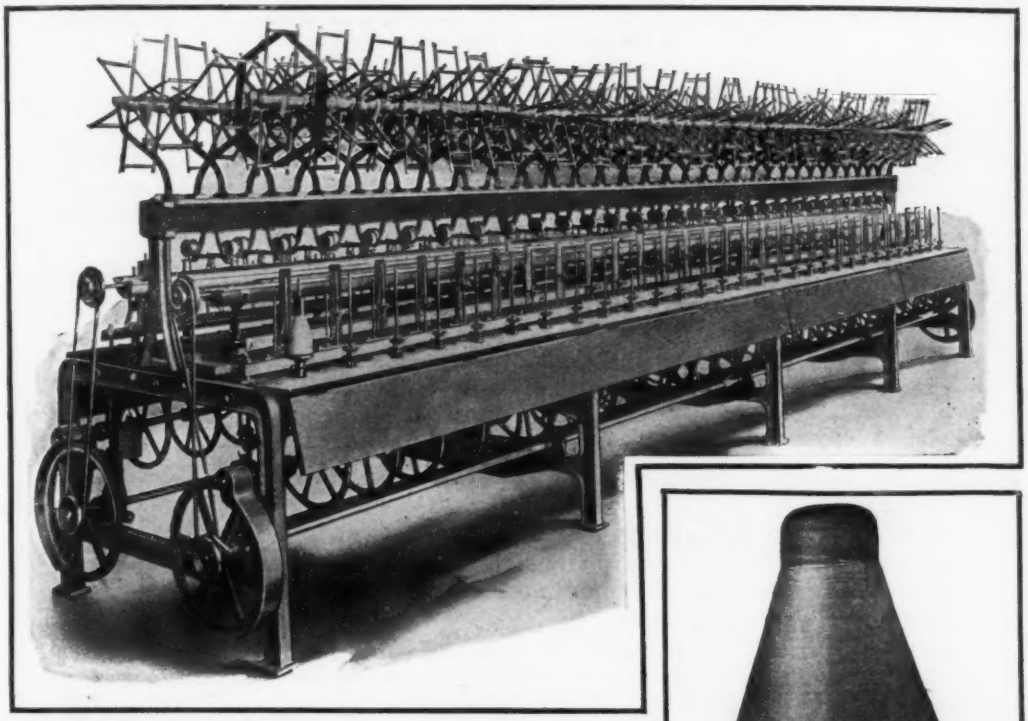
John W. Fries,

45 Lafayette St., New York.

Textile Machine Works

Reading, Pennsylvania

64 Spindle, Vertical Cone Bobbin Winders



A Thoroughly well Built Machine for High Grade Work

INDIGO

Its history and how to know it.

"The human race in general finds a great amount of pleasure in colors. The eye requires them as it requires light."

¶ This statement, which was used by Goethe in his treatise on the educating influence of colors, is fully confirmed by natural history.

¶ Man has always endeavored to beautify the work of his hands by means of colors, and an aesthetical longing, whether known or not, urges him to transfer the colors which are seen everywhere in nature to himself or to something he has made.

¶ Technical knowledge and aesthetical understanding have changed with time, but the delight in colors is still as peculiar to us moderns as it was to our remote ancestors.

¶ Indigo is the oldest of all known coloring matters; it is used to a greater extent than all others and in constanntly increasing quantities.

¶ In Europe, woad, which contains indigo, has been used in blue-dyeing for centuries; the first definite information regarding indigo was brought by the Venetian, Marco Polo, when he returned from his travels in the year 1300.

¶ Corresponding with the increase of technical knowledge, the application of indigo has in the course of time become very many sided, so that at present it plays an important part in our civilization.

¶ This is the secret of the endurance of Indigo through these many centuries. Ninety-five per cent. of the world's production of Indigo enters into the manufacture of fabrics, chiefly cotton, made for the masses; the hardest test of goodness.

SIMPLE TESTS FOR DETERMINING INDIGO ON COTTON.

Put a little piece of Indigo-dyed cotton into a dry test tube or on a porcelain plate and heat very slowly over a Bunsen Gas Burner or some other flame. The Indigo will sublime and show heavy purplish fumes.

Another very simple test is to put a little of the Indigo-dyed cotton into a porcelain dish or on a white porcelain plate and light it with a match and let it burn. If Indigo is present the porcelain will show a greenish blue film.

BRANCHES:
BOSTON, PROVIDENCE, PHILADELPHIA, CHICAGO, SAN FRANCISCO, MONTREAL.

BADISCHE COMPANY
128 Duane St., New York

COPYRIGHT 1909 LORD & NAGLE COMPANY. REG. U. S. PAT. OFF

TEXTILE WORLD RECORD

Published on the 12th of each month by

LORD & NAGLE COMPANY

FRANK L. NAGLE, President. **HENRY G. LORD, Treasurer.**

SAMUEL S. DALE, Editor.

Publication and Editorial Office

144 Congress Street, Boston.

119 South 4th Street, Philadelphia. **123 Liberty Street, New York.**
463 East 42nd Street, Chicago.

Entered at the Boston Post Office as Second Class Mail Matter.

Subscription Rates.

Textile World Record in United States and Mexico	$2.00 per year
To **Canada**, on account of extra postage	$2.50 per year
To other **Foreign Countries** (postage paid)	$3.00 per year
Textile World Record and the **Official American Textile Directory**, (Traveler's Edition),	$3.00 per year
To **Foreign Countries** with Directory (postage paid)	$4.00 per year
Dyer's Supplement	$1.00 per year

Remit by Express Order, Postal Money Order, Cheque or Registered Letter to Boston Office.

Copy for regular advertisements must reach publication office by the 25th of month preceding date of issue to insure proper attention. Transient ads., Wants, For Sale, etc., to go on Classified pages can be taken up to the 4th of the month of publication. We are always pleased to co-operate with advertisers in preparing attractive advertisements, and strongly recommend frequent change of copy, which increases the interest, and, therefore, the beneficial results of the advertising. We will cheerfully change copy as often as may be desired, providing it reaches us in time, but we cannot promise changes for next issue unless received as above stated.

Advertising rates on application.

Official American Textile Directory

Published annually, in two editions. Office, Large Size, **$3.00. Travelers',** Flexible, Smaller, **$2.00.**

A Complete Directory of Cotton, Woolen, Knitting, Silk, Flax and Jute Mills of the United States, Canada and Mexico, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments; about 7,000 in all. Full information is given about each mill in almost every instance, viz., the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct. All this and much other information contained in this book is arranged in a way to be instantly accessible.

American Directory of the Knitting Trade.

Published Annually in a handy size for the pocket, $1.50.

It contains **full reports of every knitting mill** in the United States and Canada, giving capitalization, names of the officers, including superintendent and buyer; kind of goods made; number of knitting machines, whether latch or spring needle; number of sewing machines; whether the mill dyes or bleaches or finishes; kind of power; number employed; selling agent; kind of yarn bought; lists of the jobbers, manufacturers' selling agents, commission merchants, department stores and large retailers handling knit goods and the name of the person in charge of the knit goods department. List of dyers, bleachers, finishers, printers, etc., making a specialty of knit goods work. Special copyrighted maps of the mill districts, showing the cities and towns where there are knitting mills. It is indexed so any town or mill may be quickly found.

D and M

Bleaching Assistant

For Cotton Goods

is much milder than soda ash or caustic soda. It holds every particle of oil, grease and size removed from the fibre, in solution, and allows them to pass off readily in the wash, giving a cleaner and whiter bottom; thus a smaller percentage of chlorine is required, and therefore, the loftier the goods obtained.

The use of D. & M. Bleaching Assistant insures even colors.

On yarns and underwear, it reduces the percentage of shrinkage, and increases breaking strength of all yarns.

For knit goods, its use is to be recommended, as it is less harsh than other assistants, and helps to give the sheer feel, which is desired after finishing.

Goods on which D. & M. Bleaching Assistant has been used can be brought to the desired width easier than with soda ash or caustic soda.

We shall be glad to tell you more about it.
Write to

Danker & Marston

Boston, Mass.

Table of Contents for May.

PAGE

Monthly Comment 75

The Revision of the Tariff 80

Seasonable Fabrics 81

The Knit Goods Convention and Exhibition 83

The Meeting of the National Association of Cotton Manufacturers 91

The Textile Machinery Exhibition 119

CORRESPONDENCE AND NOTES 129

Swivel Weaving—Carding Coarse Wool and Shoddy—English Notes—Silk Throwing—Humidity and Ventilation in Weave Sheds—The Mill Repair Shop.

QUESTIONS AND ANSWERS 143

KNITTING DEPARTMENT 147

The Knit Situation—Double Screw Power Press for Hot Pressing—Two New Climax Attachments—A New Vertical Spindle Bobbin Winder—Knitting Hosiery—Marking Knit Goods—Knitting Plated Fabrics—Knitting Mill News.

NEW MACHINERY AND PROCESSES 159

DYEING, BLEACHING, PRINTING, ETC. 176

The Effect of Illuminating Gas upon Dyed Fabrics—Jig Dyeing—Chlorinated Wool—A Yarn Dyeing Machine—Dye Receipts.

MILL NEWS 183

PERSONALS 192

NEW PUBLICATIONS 196

INDUSTRIAL NOTES 197

RECENT TEXTILE PATENTS 216

WOOL MARKET 241

COTTON MARKET 243

YARN MARKET 245

RAG AND SHODDY MARKET 253

DYESTUFFS AND CHEMICALS 254

Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

HOWARD & BULLOUGH,

AMERICAN MACHINE COMPANY, LTD.

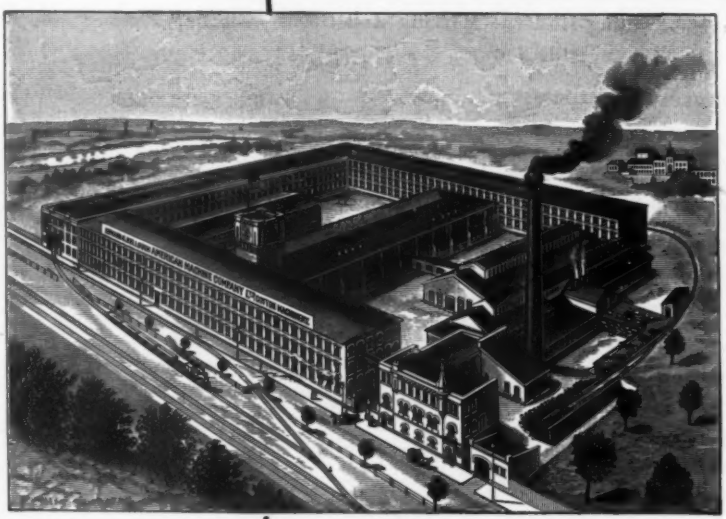
PAWTUCKET, R. I.

C. E. RILEY, Treas.
Boston Office, 65 Franklin St.

Southern Office
814-815 Empire Bldg., Atlanta, Ga.

COTTON MACHINERY

WE INVITE YOUR INVESTIGATION AND COMPARISON



Hopper Bale Openers
Feeders
Openers
Breaker Lappers
Intermediate and Finisher Lappers

Rev. Flat Cards
Drawing Frames
Slubbing Frames
Intermediate and Roving Frames

SEND FOR DESCRIPTIVE CIRCULARS WITH LISTS OF USERS.

NEW PATTERN SPINNING FRAMES
IMPROVED TWISTERS
For Wet or Dry Work

CONE WINDERS
WARPERS
SLASHERS

LIBRARY of CONGRESS
Two Copies Received
MAY 14 1909
Copyright Entry
Mar. 24, 1909.
CLASS B XXc. No.
18631 0
COPY B.

TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 37 (NEW SERIES.) May, 1909 No. 2

Monthly Comment.

The Invisible Supply of Cotton.

The report of cotton in spinners' hands on March 1, issued by the International Cotton Federation, includes statistics for the United States compiled by our census department. A year ago the Federation made its own canvass of American mills to complete the report, and it is gratifying to know that the Washington government has at last brought itself to doing this work twice a year in conjunction with the Federation which compiles the figures semi-annually for the rest of the world. The totals for March 1, 1909, and of previous reports are as follows:

MILL STOCKS OUTSIDE OF THE UNITED STATES

Date.	Spindles.	Bales on hand.	Bales used per week.	Stocks will last.
Aug. 31, '05	46,726,929	935,237	103,269	9 weeks
Mar. 1, '06	54,297,537	1,237,180		
Aug. 31, '06	66,072,303	1,210,610	145,603	8.3 weeks
Mar. 1, '07	71,054,503	1,911,071		
Aug. 31, '07	74,279,078	2,368,410	190,811	12.4 weeks
Mar. 1, '08	81,029,766	2,511,789		
Aug. 31, '08	83,371,883	2,132,045	215,472	9.9 weeks
Mar. 1, '09	85,906,697	2,425,127		

STOCKS AT AMERICAN MILLS

Date.	Total Spindles.	Bales on hand.	Bales used per week.	Stocks will last.
Aug. 31, '05	23,687,495	776,801	82,288	9.4 weeks
Aug. 31, '06	25,250,096	688,312	94,413	7.3 weeks
Aug. 31, '07	26,242,000	996,000	95,904	10.4 weeks
Mar. 1, '08, est.	27,000,000	1,089,119		
Aug. 31, '08	27,846,000	596,000	87,981	6.4 weeks
Mar. 1, '09	27,846,000	1,831,800		

The report for March 1, 1909, includes 113,752,697 spindles out of an estimated total of 130,795,927.

Improving the Baling of American Cotton.

Last month we illustrated a number of bales of cotton in the condition received at Manchester, Eng., from the Maxwell plantation at Mound, La. We have since learned that this cotton was baled by the new system of baling used by the Farmers' Gin Compress & Cotton Co., of Memphis, Tenn., which Harvie Jordan of Atlanta, Ga., has been instrumental in establishing.

Col. F. L. Maxwell of Mound, La., one of the largest cotton planters in the world, compressed his entire crop the past season on one of the gin compresses manufactured and sold by the Farmers' Gin Compress & Cotton Co. Col. Maxwell made a trial shipment of the new bales to Providence, R. I., and the same number of bales of the same grade to his local market at Vicksburg, Miss. The entire expense of shipment to Providence was the freight rate of 60 cents per hundred or $3.00 per bale and he sold his cotton there at 13 cents per pound. He sold his shipments to Vicksburg at 11 1/2 cents per pound and the local freight charges from Mound to Vicksburg, and the local charges of warehousing, weighing and selling amounted to $3.00 per bale, which offset the freight charges of $3.00 per bale on the Providence shipment. He therefore netted $7.50 per bale on the cotton shipped to Providence over that shipped to Vicksburg.

Gen. Smith and General Custom.

During the past two years we have recorded the inception and development of the plan formed by the officials at Manila to force the use of metric weights and measures on the Filipinos. The Spanish government tried to carry out the same plan from 1849 until the end of Spanish rule in the archipelago in 1898, a period of forty-nine years. The Spanish failure was so complete outside of official business that the renewal of it now is looked upon by the Filipinos as an attempt to foist a new system on them. One would naturally think that this experience of half a century was enough to deter the Manila officials from continuing the attempt to accomplish the impossible. Such, however, is not the case, for they are starting out as jauntily with the decree of 1907 as the Spaniards did with that of 1849. In order to call their attention to the futility of their course we wrote last December to Gen. Edwards, chief of the Bureau of Insular Affairs. This letter was referred to Gen. Smith, at that time governor-general of the Philippines, and we are able, by permission of the Bureau of Insular Affairs at Washington to give the correspondence here, including the letter from Gen. Smith. First comes our letter of Dec. 22, 1908, to Gen. Edwards:

Referring to an interview we had some years ago in regard to the adoption of the English system of weights and measures for levying custom duties in the Philippines, I beg to call your attention to an article on "Philippine Weights and Measures" which appears on page 82 of our January, 1907, issue, copy of which is sent to you today under separate cover.

In this connection I want to renew my recommendation that every effort be adopted by the United States government to promote uniformity of weights and measures between the United States and the Philippines by the adoption of the American standards in the archipelago. They have a senseless and impossible decree which is supposed to go into effect on January 1st making the metric system compulsory.

Following is Governor-General Smith's reply, dated at Manila Feb. 15, 1909:

The gentleman who wrote the within letter is evidently wholly unacquainted with the law as it was passed in the Philippines. There are no standard weights and measures in the Philippines. Nearly every province in the archipelago has some weight or measure different from that of the others. In Pampanga sugar is put up in jars and sold by the "pilon." In the Visayas it is sold by the "picul." Nipa juice, from which alcohol is made, is sold in many of the provinces by the "arroba." Alcohol itself is sold by the "liter." Measures of length are the "braza," "meter" and "vara." In some few places land is measured by the "cavan;" that is, the area which may be covered by a cavan of rice, which in some places is about 100 pounds, in others about 105, and in still others about 110 pounds. The "braza" is 2.7995 meters.

Lands in the Philippines as a usual rule are bought and sold according to the metric system. The metric system is customarily used for liquid measure. The business of the custom house under the Spanish regime was conducted in the metric system. No English weights or measures are used anywhere in the Islands except in Manila, Iloilo, Cebu and possibly one other town. It seems to us who are here on the ground and who really do know some little of the Philippines and of its customs and people, that it would be much harder to introduce the English system of weights and measures than it would be to introduce the more scientific and sensible metric system. The metric system is already in use here to a considerable extent and was in use long before an American saw the Philippines. Why we should introduce into the Islands a new system almost wholly unknown, and add one more to the number of weights and measures already existing, is a bit difficult to understand. The law went into effect on the 1st of January and will be enforced, care being taken, however, to inflict as little inconvenience and hardship as possible.

And here is our reply, addressed to the Bureau of Insular Affairs, under date of April 12, 1909:

I have your letter of the 15th inst. enclosing a letter from Governor-General Smith written at Manila in reply to mine of December 22, addressed to you, and desire to call your attention to certain errors in Governor Smith's communication:

1. He begins by stating that I am "evidently wholly unacquainted with the law as it was passed in the Philippines." If by the word "law" he refers to the Spanish metric decree of 1849, he is mistaken, as I have studied that decree carefully, and called public attention repeatedly to the failure to enforce it outside of official circles. If Governor Smith refers to the metric order of Aug. 3, 1906, by the Philippine Commission, he is just as far from the fact, because I received and studied that order a short time after it was issued and commented on it in an editorial, " 'Simplified Weights and Measures in the Philippines," a copy of which was mailed with my letter of December 22 to you.

2. Governor Smith says, "There are no standard weights and measures in the Philippines." He is mistaken. The metric weights and measures have been the standards for official business in the

Philippines since 1849 and are little more than that now. But Governor Smith's mistake in denying the existence of standard weights and measures in the Philippines is best illustrated by the established standards in the leading branches of Philippine industry and trade. The Spanish weights and measures are standard for 96 1/2 per cent. of the products exported from the Philippines. Hemp, which forms nearly three-quarters of the exports from the archipelago, is gathered, stripped and marketed by the Spanish arroba and its multiple, the picul. So unquestionably are these the established standards for hemp that quotations on this product are usually given by the picul without naming that standard weight. For example, "Hemp-Albay 21 pesos" is understood by everyone as 21 pesos per picul for Albay hemp. No proof that a weight or measure is standard is so conclusive as the customary omission of the name of that weight or measure when quoting prices for a commodity.

3. The well known diversity of weights and measures in the Philippines, to which Governor Smith refers, is the chief reason for unification. The dispute is not over the reality of the diversity, but is over the best way to obtain uniformity. Governor Smith thinks it is by way of the metric system. I do not think so. The authority of neither of us is conclusive despite the fact that Governor Smith was on the ground and admits he "knows some little of the Philippines." Experience is a much better guide than "any authority." For sixty years the metric system has been the official standard for the Philippines, and nevertheless after this long period the order of Aug. 3, 1906, is looked upon even in Manila as an attempt to force a new system on the people.

4. Another mistake by Governor Smith is found in his assumption that the Philippine government has been called upon to introduce the English system in the islands. That system has been introduced there by general custom, a greater power than any government possesses. Closely allied to this error is Governor Smith's statement that "the law (order of Aug. 3, 1906) will be enforced. It will not be enforced because it cannot be. If Governor Smith had studied carefully the history of weights and measures he would have recognized that the dominant influence in the regulation of Philippine weights and measures is, as it always has been, the inveterate habit in trade and industry, which for the sake of brevity we will call custom. Against custom the government is powerless. Governor Smith and his successors can, of course, continue the attempt to enforce this impossible ordinance, but the only result of their efforts in this direction will be what was so well stated by John Quincy Adams:

"In this conflict between the dominion of usage and of law, the last and greatest dangers to the principle of uniformity proceed from the laws themselves. The legislator, having no distinct idea of the uniformity of which the subject is susceptible, not considering how far it should be extended, or where it finds its boundary in the nature of things and of man, enacts laws inadequate to their purpose, inconsistent with one another; sometimes stubbornly resisting, at others weakly yielding to inveterate uses or abuses; and finishes by increasing the diversities which it was his intention to abolish, and by loading his statute book only with the impotence of authority and the uniformity of confusion."

5. I will refer to one more of Governor Smith's mistakes. He says:

"It seems to us who are here on the ground and who really do know some little of the Philippines and of its customs and people, that it would be much harder to introduce the English system of weights and measures than it would be to introduce the more scientific and sensible metric system."

Governor Smith's mistake in that sentence to which I wish to call your attention is not his inference that those not "on the ground" do not know anything about this question of Philippine weights and measures and are, therefore, not entitled to any consideration; nor is it his statement that the metric system is "more scientific and sensible" than the English; although both statements are errors. The one mistake by Governor Smith which I desire to call to your attention now is his arrogating to himself and others "on the ground" the right to decide which system is the better and which would be harder to introduce. This mistake may be explained by Governor Smith's military training and by his having been placed in authority over a people who have been trained to recognize no argument except that of superior force, but it cannot be excused by these facts, and I desire respectfully to protest against not only this error by Governor Smith, but also against the arrogant and almost contemptuous tone of his comment on my letter, which was written with the sole object of contributing by a suggestion to the uniformity of weights and measures.

In view of the close political and trade relations between the Philippines, Great Britain and the United States, and of the similarity and close approximation of the established Spanish standards to the English weights and measures, there is no escape from the conclusion that the best way to unify Philippine weights and measures is to abandon the metric order of Aug. 3, 1906, and leave the adoption of the British-American system to follow as a result of natural selection.

We will watch and report upon the development of the failure that awaits the Philippine authorities in their attempt to prevent the use of American weights and measures in a country whose welfare depends so largely on close trade relations with the United States. The question will be settled finally, not by Gen. Smith, but by general custom.

The total value of the exports from Jamaica for the fiscal year of 1907 was $9,694,102, an increase of $724,267. Of this amount the United States bought goods to the value of $5,543,313.

Better Baling of American Cotton.

A gratifying rivalry is developing in the work of improving the methods of baling American cotton. Last month we published photographs of eight bales of cotton received at Manchester from Col. Maxwell's plantation at Mound, La., with an account of the shipment taken from the "Guardian." The appearance of this item in the "Guardian"

brought on the following letter on March 30 from Thomas Crook, a cotton broker at 8 Exchange St., Manchester, Eng.:

Respecting the photographs of the improved bales of American cotton reproduced in your issue of Wednesday last, there must be some mistake in representing these bales consigned by Col. Maxwell to Mr. Macalister as the "first bales of the new style to arrive in this country." In the ordinary way of business I have for months been receiving consignments in quantity in fulfillment of orders from various Lancashire mills with greatly improved baling, the baling being in fact a decided improvement on Col. Maxwell's bales as exhibited on 'Change.

I enclose a photograph of six bales from a lot lying at the Canal Co.'s warehouse awaiting delivery to a Burnley mill and should be glad to have you reproduce this for the purpose of comparison with Col. Maxwell's bales. This system of baling is known as the Thomas-Luce system. The grower raises 5,000 bales annually and the bales may be seen in bulk by any one interested. All the blame for the ragged appearance of American bales is not due to the baling, part of it is caused by the way the tare is slashed open for the purpose of sampling in Liverpool.

As to the weight of tares, I had several bales stripped and the tare weighed under my own inspection. These averaged 12 1/2 lbs. per bale, bagging and iron bands together, against the 16 lbs. of Col. Maxwell's and 30 lbs. of the old style. Besides the lighter tares the bales are neater in appearance, more shapely and firm and more compact than the bales exhibited on the 'Change. I do not wish to depreciate in any way the good work being done by the International Federation, but it is manifestly in the interest of the whole trade that the best hitherto accomplished in this important matter of baling should be known and if, as I contend, the Thomas-Luce system is a distinct advance on Col. Maxwell's, no doubt both Mr. Macara and Mr. Macalister will be as pleased to hear of it as anybody. Although this matter of baling is unquestionably important, there seems a tendency in some quarters to exaggerate its importance, as for instance Mr. Macalister's estimate that there is a saving of £3,250,000 annually to be effected by the improvement. Such a sum would pay for the freight of all the tares of American cotton imported into England since American cotton was grown.

The saving by better baling will result not only from the reduction of freight charges, but also from preventing the loss of cotton and the decreased storage room required. It is impossible to reduce the saving from the proper baling of cotton to pounds, shillings and pence, but it would be enormous and warrants the most strenuous efforts to make it a reality. One fact is becoming plain: the c. i. f. and six contract is chiefly responsible

for the miserable wrapping of American cotton. The English cotton trade is responsible for the c. i. f. and six contract. Hence—but the conclusion is so obvious it need not be stated.

Three-quarter of Woolen Goods Manufacturers' Association.

It is understood that over 3,000 looms are represented in the Philadelphia organization of three-quarter woolen goods. Association prices will be announced for the opening of the next light weight season and the rules governing the members will be given out. One of the most important provisions is the standardization of width. All three-quarter goods made by members are to be 30 inches wide. Other points covered will be terms and cancellation rules.

Richmond Convention of the American Cotton Manufacturers' Association.

An attractive program has been prepared for the 13th annual convention of the American Cotton Manufacturers' Association, which will be held this year at Richmond, Va., on May 25 and 26 at the Jefferson Hotel.

There will be fewer set papers prepared in advance than usual, but the topics chosen are such as will arouse considerable discussion. The papers will be printed in advance and copies sent to members on request, so that they may come prepared to enter into the discussion.

The usual reduced rates on the certificate plan will be allowed by the railroads.

The program so far as completed is as follows:

TUESDAY.

10 A. M.—Call to order by President T. H. Rennie.
Address of Welcome. Hon. D. C. Richardson, Mayor of Richmond.
Reply to Address of Welcome. Col. L. D. Tyson, Knoxville, Tenn.
Annual Address. President T. H. Rennie.
Address, "Development of Foreign Cotton Goods Trade." R. L. McKellar, Assistant Freight Traffic Manager Southern Railway.
Address, "Cotton Waste Manufacture." W. A. G. Clark, Special Agent Department Commerce and Labor.
Address, "Baling and Handling Cotton." Aug. W. Smith, President Union-Buffalo Mills Co.

AFTERNOON SESSION.

3 P. M.—Address, "The Tariff on Cotton Textiles." D. A. Tompkins.
Discussion.
Report of Committee on Cotton Exchanges. E. A. Smyth, Chairman.
Discussion.

WEDNESDAY.

Report on International Cotton Congress at Paris, June 1-3, 1908. D. Y. Cooper.
Report of Committee on Uniform Sales Contract. L. W. Parker, Chairman.
Discussion.
Report of Committee on By-Laws. Chas. H. Gorton, Chairman.
Discussion.
Report of Secretary and Treasurer.
Report of Committee on Resolutions.
New Business.
Election of Officers.

Woolen and Worsted Manufacturers' Meeting.

A meeting of woolen and worsted manufacturers, estimated to represent about 15,000 looms, was held at the Waldorf Astoria, New York, the last week of April. This meeting was called for the purpose of considering present conditions of the men's wear industry with a view of arriving at some means whereby it might be lifted to a more profitable basis. Many of the manufacturers who attended are members of the American Association of Woolen and Worsted Manufacturers, but an equal number were non-members and all recognized the desirability of getting together to accomplish what would be difficult if not impossible to do individually. Frederick S. Clark, of the Talbot Mills, North Billerica, was chosen chairman and expressed the hope that steps would be taken to devise methods to help all those concerned in realizing a reasonable profit on their production and particularly to arrive at a better understanding as to calculation of costs, and adopt some uniform practice.

Among those who spoke at the meeting was Joseph E. Fletcher, President of the American Association of Woolen and Worsted Manufacturers; John P. Wood, Charles

Porter, Jr., Henry A. Francis and F. W. Freeman. One of the most hopeful signs that something of real benefit might be accomplished was the frankness of the discussion, some of the manufacturers making very plain statements of cost. The fallacy of figuring cost on the maximum production of a mill was brought up and it was the consensus of opinion that mills generally average only 2/3 to 4/5 of their maximum production and that manufacturers should, therefore, figure costs on such a basis instead of a full production.

At the morning session a committee was appointed to report suggestions which might crystallize the discussion. This committee reported after luncheon and before the adjournment a permanent committee of five was appointed with a privilege of increasing its number, the purpose of this committee being to collate information of all kinds pertaining to the betterment of the industry and to make a report to another general meeting of manufacturers to be held at the Waldorf Astoria on May 19th, the day before the semi-annual meeting of the association, which is also held at the Waldorf.

There was much difference of opinion shown in the discussion as to whether the price of yarn or the price of other raw materials, particularly wool, should furnish the basis of figuring the cost of cloth. The general opinion seemed to be that the raw material market at the time when prices are named should be the governing factor, rather than the cost to the manufacturer who might have benefited by fortunate purchases at some prior date. It was strongly urged that the first step towards reform must be some definite and generally accepted basis of figuring costs which shall take into consideration all the elements of expense.

According to the census of 1907 there were 30,700 operatives employed in the lace mills at Calais, of whom 7,500 were men, 21,000 women, and 2,200 children.

In 1906 Calais shipped 109,188 pounds of cotton lace to the United Kingdom and 1,274,821 pounds to the United States.

The Revision of the Tariff.

Since our last issue, the Tariff Bill has been sent to the Senate, referred to the Senate Finance Committee, and reported back to the Senate with amendments. These amendments have virtually the effect of restoring the Dingley rates in the wool schedules in all essential details, even in the much discussed top schedule which the top manufacturers themselves asked to have reduced. The Aldrich committee yielded to popular clamor over the Payne bill schedules on hosiery and gloves and restored the Dingley rates. The cotton schedules are amended in technical details, the rates in some instances being slightly advanced along the lines of the suggestion of the cotton manufacturers' committees. A hearing was granted the carded wool manufacturers, who presented a strong and sane brief. They were subsequently asked to state in further detail just what changes they desired.

No student of tariff making expects that either the Payne or the Aldrich textile schedules will be the final shape which the bill will give them. The Ways and Means Committee of the House made an attempt at revising the schedules. The Senate committee has made little, apparently taking the view that as the real fight will come in the joint committee, the Senate's first stand might as well be taken on the Dingley rates as on any other, if the game of political compromise must be played. Notice has been given by Senator Dolliver that the textile schedules are to be the subject of his special attention and he is expected to offer some important amendments.

Opinions differ as to the probable date of reaching a final vote on the Tariff Bill. The most optimistic do not expect the President's signature before the middle of June. The Senate cannot be hurried and each senator seems desirous of placing himself on record with a speech. In the meantime the country awaits impatiently.

There can be no question that the general tone of the press and public opinion is hostile to the Aldrich finance committee bill.

The public expects, or thinks it has been led to expect, a real revision of the tariff. In the textile schedules there is need of important changes in some sections which would be of benefit to the majority of manufacturers and improve the standing of all of them in the eyes of the public. To defy public sentiment and refuse any reasonable concessions would seem to be an unwise use of political influence. A failure to recognize the awakened sense of public disapproval of the old school methods of tariff making will bring about an early reckoning with the voters.

The textile industries in this country and particularly the woolen manufacturing branch, have always been and probably will continue to be dependent for existence on a protective tariff to offset the low wages of Europe. The compensatory duties for wool bring the final duties on manufactures of wool to a necessarily high percentage and the uninformed public generally believes that the manufacturer gets the benefit of the whole of the high duty and he therefore bears the brunt of attack from advocates of free trade or reduced tariff. For that reason there should be an honest effort to set forth the real facts, without concealment, correct the weak spots and inequalities of the textile schedules where they exist, so that they may afford the reasonable, consistent and just measure of protection that is absolutely needed—and no more. Then they can be successfully defended by an industry united in the conviction of a just cause.

SHEDDING ON THE GOING PART.

In our January issue we gave an account of an English loom in which the shed is formed by mechanism connected with the going part of the loom. This loom is the invention of Prof. Roberts Beaumont and Mr. Thomas Hollis of the University of Leeds and has been patented in Great Britain and the United States.

The world's supply of raw silk for the year ending June 30, 1907, is estimated to be 42 million pounds, of which the United States took about 38 per cent.

SEASONABLE FABRICS.

DRESS GOODS.

The conditions of the dress goods market show very few changes during the month. Reorders for the popular spring materials and colorings continue to be received. Soft satin faced materials, both plain and fancy

FIG. 1.

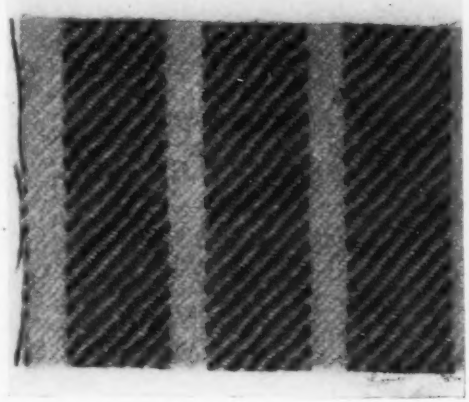


FIG. 2.

weaves, continue to be the leading sellers, in all the desirable spring shades, especially old rose and wisteria, which have been scarce all season. The cutting-up trade has taken large quantities of these shades in neat stripe effects for ladies' suits.

Cream serges, both plain and hair-line stripes, are selling very freely for spring trade. The market is short in supply of

black hair-line stripe cream serges. Calls are being made for these stripes in all grades from 50 cents to $1.10 a yard.

In the fancy dress goods market stripes continue to be favored in all suiting effects. Fig. 1 shows a neat stripe 44 inches wide from Franz Merz at 85 cents a yard. Fig. 2

FIG. 3.

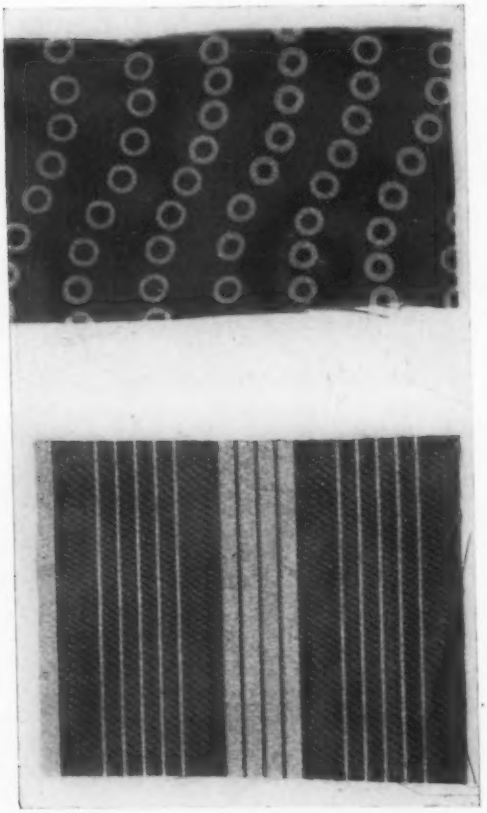


FIG. 4.

shows a 44 inch imported stripe from Arnold, Constable & Co. at $1.50 a yard.

Plain and fancy mohairs continue to be in demand for the spring trade.

The trade is calling for cotton worsted dress goods that can be sold at a popular price.

Several of the manufacturers and importers of dress goods are booking large orders for fall shipments. They report that their future order trade will exceed last year and that several of the most popular fabrics are sold up for early fall shipment. Broad cloths in the light weight chiffon finish are favored for fall in all shades.

SILKS.

The silk merchants have enjoyed one of the most prosperous spring silk seasons that they have ever had. Trade continues to be very active on all of the desirable soft satin faced silks that have been so popular this season. Prompt deliveries are being made on almost all of the new spring shades and several of the manufacturers report that they have not had surplus stocks on hand this season, and that the demand has kept up with the supply.

Foulards continue to be one of the leading silk fabrics. Popular designs are scarce and reorders are being received for these designs in all of the new spring shades. From the present outlook foulards will be popular during the entire summer season. Fig. 3 shows a neat, all over pattern, 24 inches wide, from Chas. Schoolhouse & Co. at 45 cents a yard.

Satins and messalines are popular both for immediate and fall trade. The fall trade on messalines is very active in all of the shades.

The cutting-up trade are placing large orders for these satins for early fall deliveries, and as these goods are being offered at very low prices which in all probabilities will advance somewhat before the season opens. The larger operators are placing full color assortment of messalines for fall, feeling that messalines will be one of the leading silk fabrics for the fall trade.

Rough pongees are in a strong position in the market. The trade are calling for these pongees in all grades, especially the low end silk and cotton mixed. The manufacturers of these silk and cotton pongees are receiving a ready market for their productions.

As plain colored silks have been very popular this season, the demand for fancies has not been active as in former seasons. Fig. 4 shows a neat stripe 19 inches wide from Givernaud Bros. at 42 1/2 cents a yard.

The demand for silk and cotton fabrics has been one of the features of the market, these

goods being made in plain and jacquard weaves.

COTTONS.

While the demand for some lines of cotton fabrics continues to be very active the market in general is quiet, prices are firm with no changes looked for in the near future. The buying trade continues to operate very conservatively, supplying their wants from the well assorted stocks which the manufacturers and jobbers have accumulated during the past few weeks.

The demand for mercerized poplins in all of the spring shades has been one of the features of the market. Old rose is the most popular shade. The market is short, many pieces of this shade in qualities costing from 13 1/2 to 20 cents a yard, and as these poplins will be desirable during the entire summer season the manufacturers are booking orders for complete color assortments to be delivered during the next 60 or 90 days.

Imitation linen suitings and repps are in demand for both the cutting-up and retail trade. Several of the manufacturers of these linen finished suitings have been sold ahead during the entire season and predict a good business for fall.

The trade is not reordering dress ginghams with as much activity as was hoped for earlier in the season, although the commission merchants say that before the season is over they will receive their usual amount of business on these goods and that dress ginghams will finish the season strong.

The scarcity that has prevailed during the season on apron ginghams continues. The manufacturers are sold up for the season and the jobbers are only taking orders with no guarantee of delivery, which means about 4 to 6 weeks, and then it is doubtful if a full assortment can be had.

A number of the large retail buyers have visited the market during the past few weeks endeavoring to secure suitable wash fabrics for their annual May sales. Most of these buyers placed large orders and were satisfied with the quotations they received.

A great many orders are being booked for outing flannels and blankets for fall deliveries, in fact the orders for these goods are much larger than last season, as the buying trade realize that they must send in their full assortment early to secure prompt deliveries when the season opens.

The Knit Goods Convention and Exhibition.

The annual convention of the National Association of Hosiery and Underwear Manufacturers is being held in Philadelphia during the week of May 10th to 15th. The convention meetings are held as usual at the Continental Hotel, which is also general headquarters.

The program is a long and important one and will keep the members busy. The subjects discussed are almost entirely along the lines of marketing the product rather than technical papers relating to the manufacture of goods. Most of the sessions are held behind closed doors and questions of vital interest to manufacturers may be freely discussed which would not be possible in open session.

Important results have been accomplished at these conventions in the past and the officials have given a large amount of time and effort to make the work of the association of real practical benefit to its members. As a result the growth in membership has been very rapid during the past few years and the annual gathering in Philadelphia is now recognized as the important event of the year with knit goods manufacturers.

Convention Program.

Morning Session, Tuesday, May 11, 1909.

10.00 A. M.—Meeting of the various Hosiery Sub-Associations.

10.30 A. M.—Convention Hall, Continental Hotel. Preliminary meeting of the Underwear and Fancy Knit Goods Manufacturers for the purpose of perfecting arrangements for the subdivision of their interests into Sub-Associations.

All Hosiery, Underwear and Fancy Knit Goods Manufacturers are cordially invited and expected to attend and participate in the meetings.

Afternoon Session, Tuesday, May 11, 1909.

Executive Session.

To which the Hosiery, Underwear and Fancy Knit Goods Manufacturers are invited; members and non-members.

Meeting called to order promptly at 2.00 P. M. in Convention Hall of the Continental Hotel.

Reading of Minutes of 1908 Convention.
Annual Report of the President.
Report of the Secretary-Treasurer.
Report of Transportation Committee.
Report of Membership Committee.
Report of Grievance Committee.
Report of Press Committee.
Report of Legislative Committee.
Report of Statistics Committee.
Report of Tariff Committee, W. L. Waring, Chairman.
Reports from Sub-Associations.
Report of Executive Committee, read by Geo. B. Pfingst, Philadelphia, Pa.
Appointment of Special Committees.
Communications.
Miscellaneous Business.
Discussion of Executive Committee's Report (each speaker limited to 5 minutes).

All Hosiery, Underwear and Fancy Knit Goods manufacturers are earnestly requested to attend this session and to remain in the Convention Hall until adjournment.

Morning Session, Wednesday, May 12, 1909.

Executive Session.

To which only Knit Goods Manufacturers are invited.

Admittance to hall will be strictly confined to those holding registration cards, which are given out from Booth No. 23, in Exhibition Hall, or supplied by the Secretary-Treasurer.

10.00 A. M.—General meeting in Convention Hall, Continental Hotel.

Roll Call.
Reports of Special Committees.
Advantages of Uniform Terms.
Interchange of Credit Information.
Net Weight Yarns.
Open Discussion. Each speaker limited to five minutes.
Opening of Question Box.
General Discussion on Questions Submitted.

This session is a very important one. Every Hosiery, Underwear and Knit Goods Manufacturer should attend and remain in the Convention Hall until adjournment.

Afternoon Session, Wednesday, May 12, 1909.

2.00 P. M.—Meetings of the various Sub-Associations as arranged and announced at previous sessions.

Morning Session, Thursday, May 13, 1909.

Executive Session.

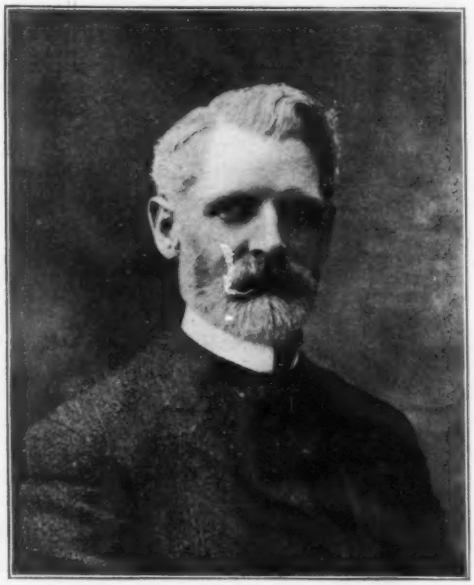
Convention Hall, Continental Hotel. Meeting called to order promptly at 10.00 o'clock.

Admittance to hall will be strictly confined to those holding registration cards, which are given out from Booth No. 23 in Exhibition Hall or supplied by the Secretary-Treasurer.

Reports from Special Committees.
Reports from Chairman of Sub-Meetings.
Miscellaneous Business.
Discussion.
New Business.
Resolutions.
Election of Officers.
Appointment of Committees.
Selection of Dates for next Meeting.
Adjournment.

Afternoon Session, Thursday, May 13, 1909.

Meetings of the various Sub-Associations, as arranged and announced at previous sessions.



FREDERICK W. SIMONS, PRESIDENT OF THE NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS.

Evening Session, Thursday, May 13, 1909.

It is quite probable that a banquet will be held on Thursday evening, upon a subscription basis—so much per plate—to those who wish to attend, definite announcement to be made at convention meetings.

The officers of the association in charge of the present convention are the following:

President, Frederick W. Simons, of Simons & Struve, Frankford; first vice president, Park Moore, of the Brown-Moore Hosiery Company; second vice president, H. S. Weihenmayer, of the Blue Ridge Knitting Company, Hagerstown, Md.; and secretary and treasurer, C. B. Carter; executive committee, Ernest Blood, Sr., of John Blood &

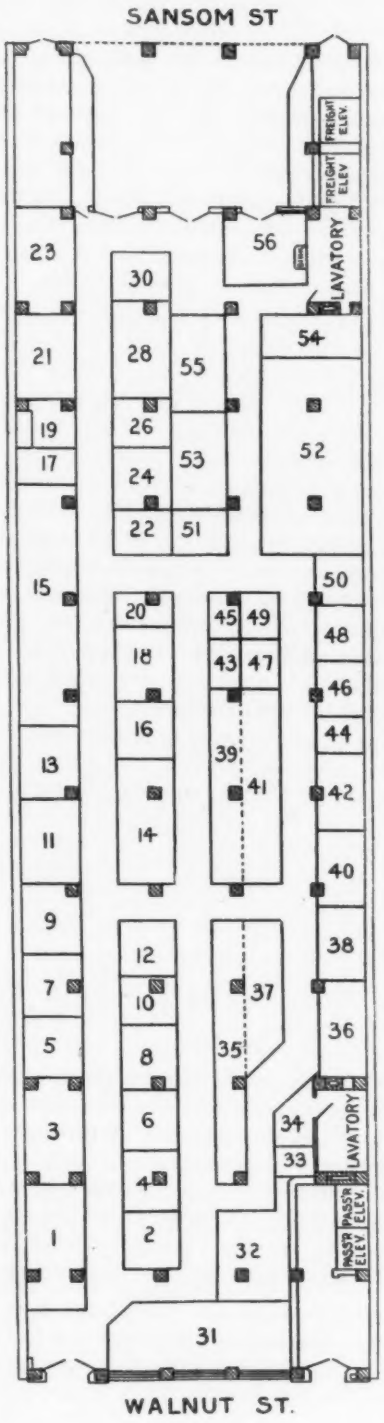
Bro.; George B. Pfingst, of the Lee Hosiery Mills; Julian S. Carr, Jr., of the Durham Hosiery Mills, Durham, N. C.; Earl Thissell, of the Lowell Hosiery Company, Lowell, Mass.; W. H. Diefenderfer, of the Auburn Knitting Mills, Auburn, Pa., and Garnett Andrews, of the Richmond Hosiery Mills, Chattanooga, Tenn.

Between the sessions of the convention manufacturers will find plenty of time to visit the exhibition of knitting machinery and supplies held under the auspices of the association. This year a building has been secured on Walnut below Tenth and extending through to Sansom St., opposite the Continental Hotel. The exhibition hall has been tastefully fitted up and with the experience of several years as a guide, the arrangements for the exhibition are more complete, with a better representation of machinery builders and more attractive exhibits than ever before. The diagram shows the general arrangement of the hall.

The scheme of registry is along the same lines as before and a record attendance is looked for not only from members but from the local knit goods mill interests. The exhibitors welcome not only manufacturers but also overseers and operators of the mills and are very glad to explain their machines to those who are expected to take charge of them under mill conditions.

At the time of going to press with this issue the exhibits were not in place so that no photographs are possible, but from advance information we are able to present the principal features of the exhibition.

The Grosser Knitting Machine Co., of 260 West Broadway, New York, and with a Philadelphia office in the Bourse, have a large space in which they show a number of knitting machines and auxiliary machines, operated by Philadelphia mill hands. Among these machines are two automatic knitting machines for sweater work, a "Diamond" seamer, an "Ideal" seamer and "S. C." overseamer for regular goods. They have equipped a power sewing machine table with four or five "Record" loopers of the latest style. A special cone winder and other ma-



chines will be exhibited should they arrive in time. Mr. Max Nydegger will personally superintend the exhibit, assisted by a competent staff who will explain the machines to interested parties. He will have an able assistant, Mr. Max Koehler from Limbach, Germany, the manufacturer of the "Koehler Twins," who makes the trip at this time to get better acquainted with the trade and while in this country will call on many hosiery and underwear manufacturers.

The Singer Sewing Machine Company has a most interesting exhibit of special machines for knit goods manufacture, most of them of recent design and specially devised for various lines of work. More than twenty different machines are shown in operation and practical samples of their work are freely given to those interested. The exhibit is located next to that of The Diehl Manufacturing Company, which supplies electric motors for operation of machines. There is a machine for attaching buttons; another one for attaching buckles; one for making an ornamental tack; machines for stitching and trimming at one operation; one for overedging; one for attaching labels; another for making eyelets; one for reinforcing drawer seats, and another for sewing edging on knit goods; one for making buttonhole facings, and another for ruffling and stitching on bands at one operation. The foregoing list only comprises some of these of more special interest, but all will be found well adapted to their respective purposes.

The Mayo Knitting Machine & Needle Co., of Franklin, N. H., exhibit the merits of the latest types of Acme and Hemphill seamless hosiery knitting machines. The recent improvements of the Acme have lately been noted in this journal. With these two machines the company meets the requirements of manufacturers from the coarsest to the finest grade of hosiery and covers the widest range in the variety of work which makes their machines most comprehensive.

Smith, Drum & Co., Coral and Cumberland Sts., builders of machinery for the dyeing, singeing and finishing of hosiery, are exhibiting for the benefit of the knitting trade one of their latest improved dyeing machines and their improved heavy power press for hot or cold finishing without plates.

The exhibit of the Standard Machine Co., 12th and Callowhill Sts., Philadelphia, consists of three of the latest improved Standard "F" type of machines which they are now building, all of which will be in operation. The display will consist of a machine running on misses' ribs for cotton, the footer being for 176 needle goods and 3 1/2 inches in diameter, transferring to a rib top consisting of 352 needles; a 200 needle, 3 3/4 machine, on half hose and also a 220 needle machine, 3 3/4 machine, running on ladies' string work. Mr. Jacob Bauer, the general manager of the company, together with Charles Schoneman and P. R. Rahn, will be on hand in their space to give any information desired by those looking at the machines.

Near the Walnut St. entrance, in space 6, the Merrow Machine Co. of Hartford, Conn., show in operation a full line of their overseaming and shell stitch machines in charge of Mr. E. H. Allen, their Philadelphia representative, assisted by Mr. P. J. Smith. Their Style 60s machine is a little wonder for welting tops of ladies' hosiery, and the same machine does the shaping equally well. The finish from their shell stitch machine is very popular this season, and is used extensively on a good class of ladies' ribbed vests and combination suits. Mr. Allen will welcome his old friends, and be pleased to show interested parties the many advantages in the use of the Merrow machines.

The Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, have one of the largest exhibits, but of course even this space is inadequate to show the large line of machinery which they build for knit goods manufacturers.

The Hurricane automatic singeing machine which has recently been put on the market is shown. The method of automatically stripping the stockings is positive without danger of injuring the stockings or making seconds. No singeing boards are

used, hence the cost of boards is eliminated, also the cost of boarding. They claim for this machine a reduction of labor of more than one-half and a great saving in gas is required. The Hurricane press for hot and cold finishing employs steel beams for the main members of the press instead of iron castings. The method of transmitting power has been improved, bevel and spur gear being used instead of worm gearing. They get great pressure with less horse power than hitherto required.

Their circulating dyeing machine for dyeing skein yarns contain a number of improvements including an automatic reversing motion for controlling the direction of flow of the dye liquor. This type of machine is also used in the sulphur process of dyeing hosiery, as the goods are under the liquor during the entire time required in dyeing.

Their rotary dyeing machine is widely used in hosiery dyeing and is provided with double doors and perforated slides in the inside cylinders for convenience in loading and unloading.

The Hurricane stocking drier is built entirely of steel and is thoroughly fire proof. Between the inner and outer layers is a lining of asbestos, thus preventing loss of heat from the drier and increasing its capacity. The bearings are outside the drier and of their improved ring oiling pattern. The drawers are made of steel angles, run on roller bearings and are easy to operate and practically indestructible. Besides the machines exhibited there will be photographs illustrating other devices for dyeing, bleaching, finishing and drying.

The S. C. F. Machinery Co. of Nashville, Mich., exhibit the Shelds web folding machine, a new invention designed to prepare goods ready for the cutting machine. It takes the place of the old system of cutting off the garments in lengths to be piled one on top of the other for the cutting machine. With the Shields folder the web is inspected as it enters the machine and folded in the proper lengths with absolute accuracy, one fold on top of the other and in perfect shape for the cutting table. An imperfect web can be disposed of by either cutting out as it enters the machine or a string can be placed between the folds where the imperfections occur. In either case the imperfect web can be removed and used to best advantage. By means of this machine it is claimed that one average man is capable of preparing the web for several cutters so that the cutting may be done by inexperienced help at piece work prices. The advantages claimed are uniformity of sizes, reduction of waste, great reduction in the price of cutting and in space allotted to this branch of work. Besides the machine described above known as their No. 2 machine, they also exhibit their No. 1 machine, which simply folds the web in ordinary lengths for storage purposes.

The Textile Machine Works of Reading, manufacturers of full fashioned knitting machines, braiders, etc., will have in operation one of their new 64 spindle winders. This machine will contain many improvements which will appeal to the visitors attending the exhibition.

The Nicetown Dye Works, Westmoreland and C Sts., Philadelphia, have a space in which their representative, Mr. Anderson, is demonstrating by showing samples and telling how it is done, why "Hagar's intense black dye" saves darning and wears longer than some of the other processes now on the market for the dyeing of hosiery and yarn.

Nonotuck Silk Co., of Philadelphia, have an attractive exhibit of silk in all forms for knitters' use in charge of Edw. B. Gorman.

The Berlin Aniline Works occupies a space which no visitor can get by without noticing their attractive display in which they exhibit products dyed with their colors, and where their representatives are on hand to give a welcoming hand and all desired information to visitors.

The Textile World Record occupies space 43 on the centre aisle where its representatives are pleased to welcome its advertising patrons and subscribers.

The Hemphill Mfg. Co., of Pawtucket, R. I., exhibit four of their latest improved machines in operation, so that manufacturers can see for themselves the improved features which have been so favorably commented upon.

The United States Hoffman Co. of Syracuse, N. Y., show their Style F underwear press for knit underwear, Style A for steaming and pressing sweaters and Style E which is known as the trouser leg press. This line of machinery is comparatively new to knit goods manufacturers, but during the past year many of their presses have been installed and those manufacturers who have not had an opportunity to see them in operation will welcome this chance for personal inspection.

The Credit Office which makes a specialty of reporting credits for the textile and particularly the knitting industry, has a booth for the headquarters of their representatives to explain their system of credit reporting. Their system is based upon registration at a central point of all points pertaining to credit of buyers and by securing the cooperation of many manufacturers in the same line, as they have done, each manufacturer is enabled to learn without publicity how the buyer pays other concerns who are selling him the same kind of goods.

The Kaumagraph Co., 156 Fifth Ave., New York, manufacturers of trade marks stamps for textile fabrics and designs for embroidering stamping, give a practical demonstration in their space showing how their process works and how the trade marks are applied to various lines of goods. They find that textile manufacturers, and particularly knit goods manufacturers, are more than ever employing their method and old conservative concerns that have been hitherto unwilling to depart from their former methods are now using the Kaumagraph process. The great variety possible is illustrated by their page plate shown in another part of this issue.

The National Laundry Machinery Co., of Dayton, Ohio, show their Electrolyzer in operation. This is the same machine that they have been selling to knitting mills and one of their representatives is on hand to explain the operation of the machine and its many advantages in the mill. The machine, which is about nine feet high, takes up floor space about 4 by 4 only and is operated under precisely the same conditions that are to be found in knitting mills. This machine has only been brought to the attention of manufacturers within a very few months, but the great amount of interest that it has excited shows that it fills a long felt want and the reports from mills where it has been installed are the best evidence of its satisfactory work. In a letter recently received from the Glove Knitting Works of Grand Rapids, Mich., in which they enclose check for a machine recently bought, they state, "We are very much pleased with the machine in every way. Our goods are coming out nice and soft and with practically no expense, as we are using water power." Every manufacturer who bleaches his product and every custom bleacher will want to see this machine in operation.

Messrs. Paxton & O'Neill, 537-41 North Third St., Philadelphia, manufacturers of full automatic knitters for ladies' half hose and footing, also for ladies' split sole and lace hose and full fashioned legger and heeler for full fashioned hose, have a number of their machines on exhibition, in operation, showing the manufacture of the different kinds of stockings which can be made on these machines. Among the number will be one of their new machines for the manufacture of split sole hosiery and to which they particularly call the attention of manufacturers visiting the exhibition.

A. H. Seemuller & Co., 231 N. Front St., have an attractive exhibit consisting of chemicals, soaps, softeners, etc., used by knit goods manufacturers in the different departments where this class of goods are in use.

An exhibit of interest will be found at the space occupied by the Climax Machine Co.,

1753-55 North Howard St., Philadelphia, who have in operation machines equipped with their Automatic High Speed Attachments for both circular and flat knitting machines which they claim will increase productions 60 per cent. over old methods.

The Beckert Needle & Supply Co., Philadelphia, have fitted up their space with desk and chairs for the reception and use of visitors. C. Walker Jones will be on hand to entertain their customers and others calling on them.

The Karl Schaltter Dye Works have fitted up their space with samples of fabrics and yarns dyed in their establishments at Ontario, Hartville and Rorer Sts., with an attendant on hand to entertain their visitors and explain the merits of their work.

The Wildman Manufacturing Company of Norristown, Pa., have in operation their latest improved underwear and hosiery machinery with experts in charge explaining and giving any information desired.

One of the most attractive displays at the exhibition is that of O. F. Zurn Co., who have fitted up their space with the goods which they manufacture consisting of their "Turkish" softener, for fast black hosiery, cotton, etc., Glycerine softener for cotton goods dyed with sulphur colors and the Improved 1909 Glycerine Softener and other products of their establishment used by knit goods manufacturers.

The E. Jenckes Mfg. Co. of Pawtucket, R. I., occupy a large space and show the Invincible knitting machines in fine gauges. They also show an attachment especially designed for reinforcing with linen yarns or yarns of like nature any number of ends. Now that there is such a great sale for guaranteed hosiery this attachment is of great interest to manufacturers who guarantee their goods. It reinforces on an entirely new principle and has met with a very favorable reception. They also show their patented self cleaning sinker, a feature that adds still further to the value of the "Invincible." At their Philadelphia office in the Shenck Bldg., 101 North 6th St., a complete line of their machinery may be seen in operation and the large demand for fine gauge machines at the present time makes this exhibit of timely interest.

The Arguto Oilless Bearing Co., Wayne Junction, Philadelphia, have on exhibition their new invention "Ravlwind," a device which they are putting on the market to be attached to loopers for automatically unraveling and winding the yarn of the looper's course after the fabric has been placed upon the points of the looper. A representative of the company will be on hand to explain its merits to any one asking for information.

Messrs. Scott & Williams, the well known manufacturers of knitting machinery at 2079 E. Cumberland St., Philadelphia, have one of the largest spaces in the exhibition in which they are showing, in operation, the different types of machinery for the hosiery and underwear trade which they are now building.

The Southern Textile Machinery Co., who have just opened up offices in the Heed Building, 12th and Filbert Sts., Philadelphia, occupying suites 815-16, have equipped their space with their new "Steady Dial Movement" looping machine and looping machines of other makes which they will have equipped with their two-thread overlocked system of looping.

James Taylor, dealer in all kinds of knitting machinery at 121 Arch St., Philadelphia, has on exhibition three or four of the different makes of ribbers, in operation, all of which are equipped with Taylor's Patent Double-Acting Attachment which gives double production to any machine to which it is attached and running to their usual speed as recommended by the builder. Mr. Taylor is on hand to give any information desired.

Charles Bond, the mill supply man at 520 Arch St., Philadelphia, has equipped his booth with belting, pulleys, hangers, etc., and a line of transmission machinery suitable for the knitting trade.

The Diehl Manufacturing Co., Elizabethport, N. J., through their Philadelphia office at 1305 Race St., are exhibiting a line of motors and generators and fans. Many of the exhibits are operated by motors supplied by this company.

The Cassella Color Co., through its office at 126 South Front St., Philadelphia, are exhibiting a line of hosiery and half hose dyed with colors supplied by this concern which are attracting quite a large amount of attention.

W. H. Tolhurst & Son, Troy, N. Y., have on exhibition one of their latest improved hydro extractors.

The Vacuum Dyeing Machine Co., in their space are exhibiting a small working model of their dyeing machine.

Roessler & Hasslacher Chemical Co. has its old space near the door. Their business concerns one of the most vital questions of interest to knit goods manufacturers, namely, a good bleach. They understand this business both from the scientific and practical standpoint, and their staff of experts is familiar with the problems which concern knit goods manufacturers, and is competent and willing at all times to visit the plant and give advice and directions on the spot.

Harding & Fancourt, Incorporated, Germantown Ave. and 2d St., Philadelphia, whose interesting exhibit at the last convention will be remembered, are again exhibiting this year as they found that knit goods manufacturers were interested in their special products for softening and finishing. Their Tuscan softener is widely used for fast black dyeing and for finishing. Franco is another of their products which is used in the boiling out of cotton to prevent discoloration, and to remove oil and kier stains and leave the goods stronger and softer. Soldine is a soluble oil which is used in a dye bath, which saves the necessity of boiling out cotton before dyeing. Besides these specialties and others, they are manufacturing all grades of Turkey red oil, olive oil, sodas, mill soaps, etc.

The Dry Goods Economist of New York occupy space 45. They have made a specialty of advertising the product of knit goods manufacturers and representatives of the R. N. A. are at hand to advise as to the best method of marketing the product.

The American Knit Goods Review of New York occupy space 46.

The Textile Manufacturers' Journal of New York is located at space 50.

The Metropolitan Sewing Machine Co., of Nyack, N. Y., show four machines on the bench in operation. Style 30 G. C. is a single needle, double thread machine for sewing on pants bands, button stays and wide bindings of all descriptions. Style 38 C. E. is a single needle double thread collarette neck binding machine with differential feed. This is for binding elastic materials with an elastic strip. Style 58 C. E. H. is a twin needle ornamental stitch collarette neck binding machine with cross stitch attachment which gives an ornamental effect on top and bottom. Style 60 H. R. is a two needle single thread chain stitch machine which is adapted to make a covering stitch on top and bottom and is suitable for sewing on lace, patches, etc. Style 80 is a multiple needle single thread machine which can be used for a great variety of work, such as button hole facing, multiple needle binding, etc. This company is building a new model of stocking welting machine which they are about ready to put on the market. Nearly all the movements are rotary and positive in action.

Barras is a coarse linen fabric originally made in Holland.

The export of wool from Great Britain was prohibited by law in 1662. The penalty for violation of this order was a fine of $15 for every pound of wool.

The origin of woolen and worsted spinning and weaving is now believed to be of very great antiquity. They are thought to belong to an era of 2,000 years B. C., for Herodotus tells us that the Babylonians wore a gown made of wool with a white tunic of the same material.

The Meeting of the National Association of Cotton Manufacturers.

The annual meeting of the National Association of Cotton Manufacturers was held this year in Talbot Hall, Mechanics Fair Bldg., Huntington Ave., Boston, on April 28th and 29th. The association accepted the invitation of the Textile Exhibitors' Association to hold the meeting in the same building with the exhibition of textile machinery and supplies which continued during the entire week of the convention. There was a much larger attendance than usual. The convention arrangements were carefully carried out and permitted a freedom from interruption which has not always been possible at their Boston conventions. We do not recall an annual convention where there has been such a large attendance of prominent manufacturers and mill men.

The first session was called to order on Wednesday at 11 A. M. by President Charles T. Plunkett and routine business was taken up and disposed of before the address of welcome. The reports of the secretary and treasurer showed the association to be in good financial condition and to have made very gratifying gain in membership. It has doubled in numbers during the last ten years. The association medal was this year awarded to Jas. R. MacColl for his paper on "The International Relations Between Cotton Spinners." In making the award the chairman of the committee stated that they had found it a very difficult matter to decide when so many good papers were presented, four others in particular, but that the winner was fully entitled to the honor.

The formal welcome to the Commonwealth were extended by His Excellency, Governor Draper, who was in his best vein and being among his friends and fellow members made of the occasion more than a mere formality. He was accorded an enthusiastic reception. The Governor spoke in part as follows:

Governor Extends State's Welcome.

Governor Eben S. Draper of Massachusetts extended the welcome on behalf of the State, saying, in part:

"Mr. President and Members of the National Association of Cotton Manufacturers:

"It gives me very much pleasure to bring you the official greetings of the Commonwealth of Massachusetts. I am privileged to extend the greetings of the Commonwealth to various organizations many times in the course of a year, but I can never do it with greater pleasure than I do to you. Having been connected with your organization and your predecessor, the New England Cotton Manufacturers' Association, practically since my boyhood, I feel a special interest and pleasure in being at your meeting in my present capacity. I sincerely trust that you will have a most successful session, and that the cause of your association may be advanced by this particular meeting.

"The exhibition of textile machinery which is being held at this time and in this building in connection with the meeting of your organization seems to me a most excellent idea. I remember very well when it was first tried in Philadelphia some two or three years since in connection with the meeting of the cotton manufacturers held in that city and it seemed to me a fine idea. It of course might be too much to attempt to have it at every meeting, but occasionally, once in two or three years, it seems an admirable adjunct to the meetings of the organization and one which will be very advantageous and helpful.

"We are at the present time in a sort of transition stage as far as business is concerned, because we are in the shadow of a new tariff law. No great tariff measure in this country can ever be passed without temporarily upsetting business conditions, but I think there has been less derangement during the passage of this act than has taken place at any time previously in thirty years when tariff laws have been considered and enacted.

"I believe this condition is accounted for by the fact that whatever the schedules may be in the new tariff law everybody knows that it is to be a protective measure. In other words, the country settled substantially the kind of tariff bill we were to have in the last election and so, while there has been uncertainty as to schedules, there has not been any great uncertainty as to policy. I believe that with the tariff bill passed, all lines of business in the country will improve and that we are to see an immediately prosperous future. I do not want a great boom and I hope we shall not have one, but I do believe we are on the edge of real permanent prosperity.

"Your industry is one of the greatest in the country and in 1907 there was collected from imports of cotton manufactures under the Dingley law $39,000,000 of revenue. This shows plainly that whatever the tariff may have been on cotton goods, it certainly was not prohibitive, and it further shows that there must have been very large importations of cotton manufactures to yield such a revenue.

"While it is undoubtedly true that very large

amounts of revenues are and must be raised for the support of the National Government by the imposition of customs duties, the importations of merchandise admitted into this country entirely free of duty have been constantly an increasing quantity. In 1820 to 1830 about 10 per cent. of the entire merchandise entering the country came in free of duty. This percentage changed materially in the following years, increasing largely, except in the period from 1867 to 1873, and from that time on it has steadily increased. In 1873 27 per cent. of the merchandise brought into the country was brought in free, while from 1892 up to and including 1908 the amount of merchandise brought in free has varied between 40 and 50 per cent. of the whole.

"While the business of cotton manufacturing seems to me to be on the whole in very good condition at the present time and will be, I believe, after the passage of the tariff bill, still better, you do not want to blind your eyes to the fact that your exports to various countries in the Far East are growing less. I sincerely hope that these conditions will change, but thoughtful men must realize that they are to have competition in the Far East in cotton goods which will grow constantly more keen as Japan enters more into the manufacture of cotton and becomes familiar with the business. She can get her raw material for manufacture substantially as cheaply as you can. She can get her machinery and plant as cheaply or cheaper than you can and can get her labor for one-quarter what you can, and she is nearer the market than you are. Under those circumstances it is not an easy competition to deal with, but on the coarser grades of goods, where the largest element of cost of production is in the cost of the raw material, we may still hope to do a large business because of the quality of our product.

"As I said earlier, I am extremely glad to be here today and welcome you to the Commonwealth, and I sincerely trust that your association and the great business which you represent may be deservedly prosperous in the future."

The response to the Governor's address was made by Mr. Franklin W. Hobbs, one of the vice presidents of the association. Mr. Hobbs said:

I know it has been a pleasure to each and every one of you to hear the kindly greeting and welcome which the Governor has extended to us in behalf of the old Commonwealth of Massachusetts. It is a special pleasure on our part to extend a welcome to him, for, in addition to being the Governor, he is also an honored member of this association, and to many of us a valued personal friend.

In this connection it is perhaps of interest to note that while the textile manufactures are the chief industries of Massachusetts and the very backbone of her great prosperity, we have never in her history had a man in the Governor's chair who was directly connected with the cotton manufacture, and only once, in the case of Governor Talbot, have we had a man who was directly connected with the woolen manufacture.

The present Governor is, of course, a cotton machinery manufacturer, and we are glad to be even so indirectly represented. In fact, it will doubtless seem quite natural to most of us to be governed by a machinery man, and perhaps that is all a mere manufacturer should expect!

But, seriously, it seems strange that, from John Hancock in 1780 until Eben S. Draper in 1909, no man even indirectly connected with the great cotton industry has sat in the Governor's chair. However, gentlemen, if no man actually in the business can be Governor, we may congratulate ourselves on the fact that after waiting for 129 years we have at last secured so able a representative of our great industry. We are fortunate indeed at this time to have in the position he occupies an experienced, sane business man, a man of large affairs, a man personally familiar with the great questions of capital and labor and one who has the courage to demand, and the ability to secure, equal justice for all. With such a man as Governor I believe we may look forward with confidence to the future, knowing that he realizes the relation our industry bears to the welfare of the people, and that any legislation that hampers industry will hamper labor as well and in the end bring disaster and suffering to all.

President Plunkett then delivered the annual address:

President's Address.

CHARLES T. PLUNKETT, Adams, Mass.

A year of vicissitudes has passed into history. It has been recorded that nearly all of the conceivable transmutations in business experience, excepting financial stringency, have been in evidence, the exception being due to a reaction from the acutest panic of recent years, immediately preceeding.

Memories of untold value are entailed to all sagacious managers of commercial and industrial forces, to all intelligent operating officials and to every genuinely ambitious aspirant for managerial position.

No greater misfortune could befall a business enterprise than that conflicts arising from radical changes, unexpected events, alarming emergencies and depressing conditions should be met by minds without the training imposed and impressed by trying ordeals, such as have peculiarly characterized the twelve-month just passed.

Collectively and individually human successes are as a rule the rewards of faithful application of previously absorbed knowledge; and the semi-monotonous periods in manufacturing are not conducive to the rapid acquisition of the wealth of resource which is essentially the product of compelled alertness and driving necessity.

Possibly the tardily returning but immeasurably strengthened markets for goods have superficially discredited the more optimistic of last year's prophets, yet the unerring tendency has been toward better and healthier conditions, contrasting strikingly with the opening months.

Indeed, the very conservatism which was compulsory in the spring of 1908, but which with excellent judgment has been continued to this time,

establishes a foundation upon which erstwhile timid prophets may dare to stand.

The abundance and cheapness of loanable funds, the substantial reinforcement of mercantile credits, the absence of accumulated stocks, the extraordinary distribution of wealth in every part of the country, renovated and remodelled plants all portend an era of prosperity for employer and employe with which congressional action is unlikely to interfere even by such a jeopardizing quality of discussion on pending measures as will preclude prompt resumption of activities.

RETURNING IMMIGRANTS.

The tide of immigration again attracts the attention of publicists who urge as its significance the assured demand of quickening industry.

As quiet and constant as the outward flow, when the paralyzing effects of financial panic disturbed American railways and work shops, is the incoming current of hundreds of thousands of human beings, whose knowledge of the world's best field for service, has weaned them from fatherland, perhaps this time to become American citizens, an honor for which they are now better prepared than when first they presented themselves, with doubtful qualifications, to pass the immigrant station.

Fortune smiled on many congested communities when a half million people took their departure, using accumulated resources to visit native lands, there to reside until the pendulum had commenced its returning swing to normal opportunities for earning a livelihood.

Among the arriving multitudes, therefore, are hosts of somewhat experienced guides whose counsels will unquestionably influence the new comers to channels of labor, which previous residence taught them to select, and from those unfortunate employments in which there is already a surfeit of toilers.

Should this deduction be corroborated, as early records indicate, then there appears to be at least a partial solution of the very serious problem of distribution of immigration, brought about through a natural adjustment, the resultant of unforeseen and unavoidable circumstances. The industries at least will need the proportion of laborers available for them, and will, in turn, supply the necessities of the enlarged market brought to our very doors.

COTTON.

The Census Bureau Ginners' report to March 1st showed a total, including linters, of 13,564,000 bales of the growth of 1908, being approximately equal to the previous record crops of 1904 and 1906. In reality the spinnable superiority of the latest crop will insure a greater goods production than did any of its predecessors. Compared qualitatively with the very inferior grades and staple of the 1906 crop, the disparity in waste shrinkages alone would account for a large increase in merchantable product, while the necessarily difficult, and well nigh impossible task of full maintenance of mill standards with the earlier crop will not confront the spinners this season.

Early picking, liberal buying, undelayed transportation, freedom from disastrous conflicts with natural laws of trade, and consequent comparative uniformity in prices (the variation being about 150 points), is a further fortunate augury for all interests from planter to consumer.

There is every promise that accelerated consumption by old and augmented requirements of several million new spindles will demand an equally large crop in 1909.

FOREIGN COTTON CULTURE.

Foreign governments have continued to encourage colonists to engage in cotton growing; Germany going so far as to offer free gins, presses and transportation. Spain has awarded prizes to stimulate this division of agriculture, while Russia has largely reduced its importations by domestic cultivation. Immense sums of money have been expended in betterment and extensions of sea and land transportation.

It has been the hope of the foreign spinners that with active cooperation on the part of European powers, a sufficient portion of the vast areas in Southern Asia, Northern Africa and insular possessions, said to be suitable in soil and climate, might be cultivated by natives to at least hold in check alleged tendencies of American growers or speculators to control by restricted acreage or manipulated markets the prices of their raw material.

These hopes have not been realized nor have the efforts met the expectations of the purchasers of more than one-half of our cotton crop in addition (to our discredit be it said) of one-quarter of our cotton waste. Yet they will not be disheartened in their determined attempts to protect their vital interests at all hazards, and naught but ample crops, careful handling and rational commercial practices will prevent ultimate success. The present crop has, with the shop worn exception of baling, more closely approached these conditions than has any of recent years; and being coincident with a convalescence from industrial indisposition may illuminate and emphasize the possibilities of permanent supremacy in an indispensable product of American soil.

Of the perennial suggestions issuing from all spinners' associations regarding the tare on the American bale and the inadequacy of the Exchange contracts, the stereotyped phrases may still be used. There is, however, a meritorious recommendation of the Federation of Master Cotton Spinners made in March, known as the "Net Weight Contract," which is worthy of our consideration, though particularly adapted to export shipments.

If the adoption of this contract does lead to "improved methods of baling cotton as was recommended by the Atlanta Conference," then will it have accomplished one of the most beneficent acts of the century to grower, carrier, banker, merchant and manufacturer.

GROWTH OF COTTON MANUFACTURING.

The report of the International Federation of Master Cotton Spinners indicates a rapid increase in spindles in all countries during the three years since 1905. That of the past year, however, largely included completed plants of earlier inception. The astonishing additions in Lancashire

of quite 11,000,000 spindles in the three years, brings the English total, exclusive of doubling and waste spindles, to 53,000,000, practically double America's total. In view of the amazing growth of an industry, which is now one of the most important in Great Britain, a news item of August 2, 1768, reprinted recently in the New York Commercial is interesting. "Yesterday, three tradesmen's wives of this city were convicted before right honorable the lord mayor for wearing chintz gowns on Sunday last, and each of them was fined £5. These make eighty who have been convicted of the above offense within twelve months past."

It appears that in 1721 Parliament imposed a penalty of £5 upon the wearer and £20 upon the seller of a piece of calico. Fifteen years later the statute was modified to allow the use of calicoes

CHARLES T. PLUNKETT, REELECTED PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

made in Great Britain, "provided the warps thereof were entirely of linen yarn," the linen manufacturers as well as the woolen having been chiefly instrumental in the enactment of drastic laws against cotton and cottons.

At the time of the "tea party" in this city, England imposed a duty of six cents per yard on printed cottons of foreign manufacture, which must have been a very satisfactory protection to her manufacturers. It was raised, however, in 1806, to seven cents per yard.

From the prejudice and discrimination against cottons of less than two hundred years ago to their use by the larger part of the world's population is a long step; measured in value it amounts in the importations of the Orient alone to $400,000,000 of which the United States furnishes one per cent.

American manufacturers are enamored, and justly so, of the world's best market, to the exclusion of that attention to infinite detail requisite to gain and retain foreign trade.

Lack of competent commercial representatives, adequate banking, mail and transportation facilities together with faintness in government cooperation, amounting, I believe, to a net expenditure of $240,000 for consular agencies, partially accounts for the ineffectual efforts to permanently establish satisfactory commercial relations with distant people.

BOUNTIES AND TAXATION.

Massachusetts offered a bounty in 1789 of £500 to a corporation which should, within seven years, manufacture 50,000 yards of cotton piece goods of a quality usually imported and this led to the incorporation of the Beverly Cotton Manufactory. In view of the steadily increasing burdens of taxation, particularly on corporations, which has already deprived the state of millions of dollars in capital investments and discouraged an unknown number of enlargements of existing plants, the preamble of the above bounty act is interesting. "Whereas, the promotion of useful manufactures, and particularly such as are carried on with materials of American produce, within this Commonwealth will tend to the happiness and welfare thereof, by increasing the agriculture and extending the commerce of the country; and, whereas, John Cabot," etc., etc.

Although conditions have materially changed during the century which has elapsed and bounties would now be inimical to civic welfare and altogether undesirable, there should not be less recognition of the fundamental fact that here and in many other states, the productive industries are substantially restricted to agriculture, mining, fisheries and manufacturing, and the latter is by far the greatest employer of labor and is a constant creator of property, taxable by states and municipalities.

In contradistinction to this class of property may be placed those unproductive pursuits, which may employ labor, but do not add to taxable wealth of a community by their output, but which are, in the main, themselves dependent upon productive industries.

STANDARD SPECIFICATIONS.

Comment upon the difficult undertaking of the committee on Standard Specifications for Staple Gray Goods can better be made when the report is presented; mention being here made for the double purpose of urging members to hear the report and prepare for the discussion and to express to the members of the committee, who are eminently qualified to investigate this or any subject relating to the cotton industry, the appreciation of the Board of Government.

The committee was asked, first, to make up and report to the Association a standard for allowable variations from the specifications of width, count and weight of ordinary staple grey goods, and

second, to prepare and report, in conjunction with a committee of the American Cotton Manufacturers' Association, on a form of contract covering the sale and purchase of staple grey goods, that may be used by the trade, and thus improve and unify custom in this respect. The success of the distinctly progressive policy of the two Associations in seeking, by efficient committees, to study intricate problems as they arise, and from their reports take intelligent and united action, is admirably demonstrated by the harmonious proceedings of these "specifications," and "contract" committees, and warrants not only their continuance until the work assigned them is completed, but justifies a pursuance of this method of dealing with matters of supreme concern to the entire industry.

BIBLIOGRAPHY.

During the year the secretary has been engaged upon the compilation of a bibliography of works pertaining to cotton manufacturing, a task involving arduous and painstaking labor outside of his duties, and one for which he was fitted by his long acquaintance with the subject and knowledge of foreign languages.

The accumulated income of the George W. Weeks' fund permitted this to be done without expense to the Association, while the annual income will probably be sufficient for the extra clerical labor for continuance and it seems obvious that it could be applied to no more useful purpose, nor one that could better accord with the wishes of its donor.

It appears strange that such an important subject as the cotton manufacture, which is one of the great industries of the world, and whose processes and economics have been the subject of hundreds of books and thousands of essays, should not hitherto have been the subject of such a compilation.

The importance of this bibliography as a source of reference will undoubtedly be of great value, and it is probable that it will be deemed desirable to continue the addendum by noting additional publications in the Transactions for the annual meetings in years to come.

PRESERVATION OF WATER POWERS.

The Association has continued its vigorous action on legislation by the Federal Government to stop this forest waste at the headwaters of rivers flowing into the Atlantic Ocean. The measure has passed the House, but too late for action by the Senate, which has already voted three times in favor of the measure, but it is expected at a later session that this important measure will become a law.

The Board of Government has passed a resolution urging that in view of the extensive improvements in transportation facilities which are urgently required, that all legislative bodies should refrain from restrictions which would interfere with the development of such improvements.

It will be unnecessary to remark upon the year's mechanical improvements in the products of inventive genius, for The Textile Machinery Manufacturers' Association, as you are aware, has brought about a conjunction of two forces which readily unite under favoring circumstances, progressive men who will buy a machine when they are convinced of its merit; and machinery which is especially designed to the requirements of critical and discriminating men. The building in which we meet is exceptionally adapted for this purpose, but the plan will not be worthy of continuance should the assenting members present interference during the hours of the four sessions on our program. At the risk of being charged with crossing the great gulf between manufacturing and etiquette, I feel constrained to recall several embarrassing occasions when members left the halls before or during the addresses of guests, and to express the hope that at this and future meetings, neither guests nor other speakers will be chagrined by disappearing audiences, due allowances being made for the entrance and departure of those who have definite interests in special papers.

The Secretary's Report.

Much of the work of the Association requires that composite which is the result of the concurrent action of experienced minds, and is the result of deliberations of committees. Great amount of labor has been performed by the Committee on Standard Specifications for Staple Gray Goods, and it is confidently expected that the results will be of great value to the industry.

The expenses of this investigation are large, and the Board of Government were authorized at the Saratoga Springs Meeting to expend $2,000 on this behalf, and to solicit subscriptions for the same. At the present time the subscriptions have not reached the amount estimated by the committee, but their work is proceeding, and the membership, it is expected, will undoubtedly furnish the adequate funds.

The results of this work, like much of the other work of the Association, extends throughout the cotton manufacturing interest, and is not limited by membership in the Association.

The action of the special Committee on Publication, which resulted in the Suggestion to Authors of Papers and the Instructions to the Press, which were adopted at the Saratoga Springs Meeting, have been of great practical utilization in the arrangements for the meetings.

NEW YORK COTTON EXCHANGE.

The New York Cotton Exchange appointed a committee looking to the improvement of the cotton contract so that its application will be equitable and fair to all alike. They have investigated the question of the commercial spinning value of grades above and below middling, and in compliance with their request, a committee consisting of Messrs. James R. MacColl, Albert F. Bemis, John J. Connell, Edward W. Thomas, and William I. Woodward held several conferences with their committee.

This question of the relative spinning value of the various full grades of cotton in proportion to the base grade of middling providing that all grades be of the uniform color, length and staple, is one upon which there are necessarily many di-

vergencies of opinion and it is anticipated that the results of this committee will give a concensus of opinion of great value.

UNITED STATES DEPARTMENT OF AGRICULTURE.

The United States Department of Agriculture has continued in its policy of intelligent investigation on all matters pertaining to the improvement of the cotton fiber. This Association was requested to nominate a member for this Commission on Standard Cotton Grades and the suggestion of Gen. Stephen M. Weld was highly acceptable, but other duties prevented him from meeting with the Commission, and Nathaniel N. Thayer, Esq., served in his stead. While this Commission is not a body having legal authority and its work must be solely that of the influence of the decision of experts of the highest character, the membership of such a commission cannot fail to commend itself in this respect.

The Association has given to the members in a number of instances information upon proposed Federal legislation, which was probably at variance with the interests of many of the members. At all events, it was considered important that the members should be informed of the state of affairs. There is no information on record as to what course individual members may have taken, but it is a fact that no instances of such legislation have been enacted.

The Association has kept closely in touch with the measures introduced at Washington for the preservation of forests at the head waters of the rivers in the White Mountains and the Appalachian Mountains. After a long delay this measure which has three times passed the United States Senate, was passed by the House, but it was too late in the session for the Senate to take action, and similar measures will doubtless be introduced again. Meanwhile the cutting of the timber, the burning of the slash by lightning or by campers and the erosion of the soil at the head waters of these rivers, which are so important for the cotton manufacture and other industries, both North and South, is continuing at the rate of, it is estimated, over 1,000 acres a day, and whatever action may be taken by Congress in the future, the users of water power will continue to be losers by these delays, which have impaired the regularity of the flow which furnishes a motive power to so many mills.

BOOKS FOR THE LIBRARY.

One of the functions of this organization, as stated in the charter, is to collect a library on textiles, to which there have been contributions in the past. It is hoped that each member of the Association will contribute to this library a copy of any books on textiles which he may have written and beyond that copies of other books on textiles will be gratefully received.

Although copies of the earlier volumes of Transactions are very rare, the Association has a supply of Transactions issued during the last fifteen years, and can furnish members with copies at a very low price.

THE ASSOCIATION MEDAL.

The Association Medal for the year 1908 was awarded to Charles H. Fish, of Providence, R. I., for his paper on General Questions on Cotton Mill Fires; the committee on award being Charles B. Burleigh, chairman, W. Irving Bullard, Nathaniel B. Kerr and Charles T. Main. The committee for the present year are Charles H. Fish, chairman, William A. Congdon, Henry D. Martin, Franklin D. Williams and Daniel A. Tompkins, and they will report their decision at the meeting.

This Association Medal was established by a trust which the Association, April 26, 1898, adopted on the action of the Board of Government in applying the income of the funds established in 1895, for this purpose as is recorded in Volume 68 of the Transactions page 79. The recipients of this medal have been Charles H. Fish, 1901; Sidney B. Paine, 1902; William D. Hartshorne, 1906; Charles B. Burleigh, 1907; Charles H. Fish, 1908.

THE STUDENT'S MEDAL.

The Student's Medals for the encouragement of textile education which is supported by a fund donated for that purpose by the late Moses Pierce of Norwich, Conn., in commemoration of his ninety-second birthday, July 3, 1900, have been awarded during the year to Karl A. Paul, Philadelphia, Pa., a graduate of the Philadelphia Textile School; Maurice Hendrick, Shelby, N. C., a graduate of the North Carolina College of Agriculture and Mechanic Arts, and William Gardiner Blair, Whitinsville, Mass., a graduate of the New Bedford Textile School.

The method of awarding the student's medals was changed two years ago by vote of the Association and in place of special committees of the members appointed by the Board of Government to make the examination and then the decision, certain rules were adopted and sent to all of the known textile schools in the United States.

Under these rules, copies of which were sent to textile schools this year, the student's medals will be given in 1909 to each of the following textile schools, which comply with the conditions of award.

Lowell Textile School, Lowell, Mass.; North Carolina College of Agriculture and Mechanic Arts, West Raleigh, N. C., and the Philadelphia Textile School, Philadelphia, Pa.

The Association Scholarship at the New Bedford Textile School was awarded by the Board of Government to Roger M. A. Wilcox of Portland, Me.

Mr. Wilcox was graduated by Harvard College as a member of the Class of 1906, completing his course in three years, and by the Harvard Law School 1908, both of which courses were taken as preliminary equipment for his present line of study which will lead to his future work in cotton manufacturing.

MEMBERSHIP.

During the past year the following five members have died: W. N. Blackstone, O. B. Parker, Justin A. Ware, Nathaniel B. Borden and George E. Zellers, biographical sketches of whom will appear in the Transactions.

The financial stringency of the year has had its influence on the membership of the Association, as in addition to the five deaths there have been twenty-five resignations, and thirty dropped for non-payment of dues, as some appeared to prefer the latter method of separating from the Association.

On April 1, 1908, the membership was 939, and during the year 82 have been elected, making the membership on April 1, 1909, 961, to which will be added in the appendix to this report the number elected at the forthcoming meeting.

MEETINGS.

The Association has held two meetings during the past year, one at Boston, April 16-17, 1908, and one at Saratoga Springs, New York, September 29-30, 1908.

The Board of Government has held seven meetings during the past fiscal year at which directions have been given for the many affairs necessary for the conduct of this Association. The Association appreciates the necessity of the cooperation of its members in every respect and invites suggestions and comments at all times from the members.

The President then introduced Col. Albert Clarke, Secretary of the Home Market Club of Boston, who spoke on The Importance of Outside Conditions, saying in part as follows:

Importance of Outside Conditions.

COL. ALBERT CLARKE, Secretary Home Market Club, Boston, Mass.

Some of the conditions upon which success in manufacturing depends may be said to be outside of the business and sometimes wholly disconnected from it. I think you will all agree that after you have attended to the technical part, the main thing is to make good sales. Good sales imply not only good salesmen but good markets. Good markets depend upon the purchasing power of the people, and the ability of the people to buy depends upon general employment. If we allow our goods to be supplanted in the market by other goods, all our technical work, however excellent, has been in vain. If our plant is established in a city that is plundered and overtaxed, we cannot prosper even though our technical and commercial work has been done to perfection. If the nation has an unsound currency, it will turn to Dead Sea fruits the best products of our men and mills.

Sometimes manufacturing is temporarily stimulated by a state of war and there are people who favor a powerful navy because of the employment that is given to men, money and materials in creating and maintaining it. But this is a poor argument. If a navy is necessary to peace, let it be kept for that reason and that alone. War and all its instrumentalities are enormous wastes, and in the long run production thrives better in peace. In fact, I think it truthfully may be said that the conditions precedent to manufacturing prosperity are (1) the political and industrial independence of a country; (2) a good currency and banking sysetm; (3) honest and economical government, national, state and municipal; (4) the employment of the people in peaceful and not in warlike pursuits; (5) the preservation of the public health; (6) systems of education adapted to practical use; and (7) the protection of industry from aggressive foreign spoliation.

Most of these conditions are so self evident that they require no argument. Some of them, however, have long been subjects of dispute. There are men, even manufacturers, who say "Give us freedom and we will conquer the world." But we cannot give them freedom to conquer the world, because the nations of the world do not wish to be conquered. They erect barriers in self-defense and they would be foolish if they did not. Complete freedom of trade within the boundaries of a country is wise, because conditions there are substantially equal, but unregulated trade is an invitation to piracy, or at least to such an approximation to it as stops short only of crime and force. Our interstate commerce law essays with some success to prevent discriminations in favor of men or corporations or cities; in other words, it regulates transportation. Its jurisdiction, however, extends but three miles from shore, and the result is that after our trunk lines to the interior have given a rate to the steamship companies, the latter make rates on through bills of lading which are lower from Liverpool to Chicago than rates are from Boston to Chicago. This is unregulated trade. It partially nullifies our protective tariff and but for what remains would close our mills.

Many manufacturers desire reciprocal trade relations with other countries, and are willing to exchange the protection of some other man's industry in the home market for a little better chance for their own industries in foreign markets. The mere statement of such a proposition is to show its unfairness. It is more than unfair because it is provocative of rivalries and dissensions at home and abroad. Why should there be special tariff rates between industries and countries any more than there should be special freight rates between industries and cities? The Payne bill, upon which the eyes of the people are now centered, wisely provides one and the same tariff towards all countries, and if one country discriminates against us, that bill gives the President authority to increase duties against that country. This will give us some degree of industrial equality both at home and abroad. It will be a condition ulterior to your business but helpful to it.

When a tariff is being revised there is naturally contention between industries and most men to look out for their own schedules only. I think this is a mistake, because general prosperity is essential to each branch of business. When the Wilson tariff was seen to contain a fairly good cotton goods schedule, many in that business thought they could do well, even if the woolen

men could not. They learned their mistake. All our industries are so interlaced that they are affected by each other. Above all rivalries the principle of "live and let live" should prevail, because a strong market is the sine qua non of success.

The greatest glory of good government is its humanity. When George T. Angell was borne to his final resting place, the procession of sleek work horses, wearing mourning rosettes, which followed him, bore mute testimony to a life work that exemplified a modern tendency toward the uplift of man as well as beast. You manufacturers who have provided comforts and sanitation for your employes are like this angelic man. A nation which guards the natural opportunities of its people, so that their employment shall not be taken from them is also an exemplar of humane thoughtfulness and care. Why is our country still sought by the youth of all nations? Why are they coming here from Great Britain in increasing numbers? Because that country is burdened by militarism and blighted by imports which dry up its farms and close its mills.

Peace and prosperity are the great conditions that men seek, and they are worth more than all the battleships for a nation's defense. Peace and prosperity give every man a chance. By making the units of society strong they make the social fabric invincible. If they are not "a policeman on the spot" they are better, because they warn all offenders to let us alone. Peace and prosperity are not only humane, but they are virile. Instead of destroying they build. They create an atmosphere in which the workman goes singing to his task. They reward industry and skill, they stimulate invention, they throw forward the search lights of progress and they inspire the world. Conditions like these will make spindles hum and are even more essential than the selection of fibers and the prosper twisting of threads.

Prof. George F. Swain of Harvard University was then introduced and delivered a most interesting address on Conservation, touching not only the conservation of forests, a subject on which he has had much to say with authority, but pointing out great losses and wastes through which property values to the extent of hundreds of millions are being literally wasted.

Conservation.

PROF. GEORGE F. SWAIN, LL. D., Boston, Mass.

The natural resources which we have been wasting so recklessly and which it is so necessary to conserve, are generally considered to be four in number, namely, the forests, the waters, the lands and the minerals. That we are wasting these resources most recklessly has been very apparent to far-sighted observers.

Professor Shaler long ago made the statement: "Of all the sinful wasters of man's inheritance on earth,—and all are in this regard sinners,—the very worst are the people of America."

Professor I. C. White, in his address at the conference of the Governors said:

"What will it profit this nation to have won the wealth of industrial supremacy, if in our thirst for gold and sudden riches we permit corporate greed, as well as individual avarice and selfishness, to waste and devastate the very sources of our prosperity? For just as sure as the sun shines, and the sum of two and two is four, unless this insane riot of destruction and waste of our fuel resources which has characterized the past century shall be speedily ended, our industrial power and supremacy will, after a meteor-like existence, revert before the close of the present century to those nations that conserve and prize at their proper value their priceless treasures of carbon."

The seriousness of this waste will perhaps be apparent when it is remembered that many of these resources "have required untold ages for their accumulation; that no human being has contributed toward this accumulation or has increased the intrinsic value of these resources; and that hence their present owners, whether acquiring them through discovery or purchase, have no right to waste or destroy that which is necessary to the wealth of the nation, which they did not create and which they cannot replace." A man may have a right to waste, or to use in any way which he pleases, property which he has himself accumulated, but he certainly has no right to waste the resources which God has given us, and which belong as much to our successors as to ourselves.

Let me give you some figures to illustrate what this waste amounts to.

With reference to our forests, the people of the United States use annually 40 cubic feet of wood per acre, while the natural growth produces 12 cubic feet per acre. We are therefore using over three times what we produce. And if asked whether we need to use this large quantity, we may answer by bringing forward the fact that while the consumption of wood in this country amounts to 260 cubic feet per capita, Germany uses only 37, France 25, and Great Britain 14 cubic feet per capita. Moreover, forest fires consume each year immense quantities of merchantable and young timber. Since 1870, forest fires have each year destroyed an average of fifty lives and fifty millions acres of forest.

In our use of timber there is great and unnecessary waste due to uneconomical and careless methods of logging and sawing and to the lack of cooperation between the different industries. Only 320 feet of timber are used for each 1,000 standing in the forest and cut for use. Tanning establishments utilize the bark from thousands of trees and leave the naked trunks to die and rot or to be destroyed by fire, while in other localities the lumber is used and the bark wasted. Uneconomical methods of boxing trees in obtaining turpentine result in the destruction of many valuable trees each year. Wherever we look we see evidences of waste and extravagance, much of which is preventable. As a result of all this the price of lumber has steadily risen, and yellow pine now costs 65 per cent. more at the mill than it did in 1900.

If we turn to our mineral resurces the waste is perhaps even more alarming.

"The seriousness of this loss is more clearly appreciated when it is remembered that our production and consumption are increasing much more rapidly than the population of the country; that the mineral supplies for future use are limited in quantity and cannot be reproduced. No new supplies are being created to take the place of those withdrawn from the earth and either used or wasted. When once these supplies are exhausted, the exhaustion is complete and permanent."

Natural gas, the best of fuels, is allowed to waste without restraint in many parts of the country. The amount known to be going to waste at the present time is sufficient to light all the cities of the United States having a population of over 100,000. In one field alone in Louisiana, there is enough going to waste to light ten cities as large as Washington. Within twenty-five years, at the present rate of use and waste, all the known supplies of natural gas will be exhausted. Only one state, namely Indiana, has passed effective laws directed against the waste of natural gas.

With reference to oil, at the present rate of increase, the available supply will be exhausted before the year 1950. Much of this valuable resource is wasted in various ways, particularly by improper use as fuel when other fuels would suffice.

If we turn to our coal supply, we find that by uneconomical methods of mining and by the extraction of only the high grade material and allowing the mines to cave in, a large percentage is still wasted, although there has been an improvement of about 50 per cent. within recent years. Nevertheless, the easily accessible and available coal in this country will, according to the best estimates, be exhausted by the middle of the next century. It is a remarkable fact that in any period of ten years the production of coal, and therefore its consumption, equals the total production up to the beginning of that period. Whether this enormous rate of increase will continue is, of course, a matter of speculation and must be considered at least doubtful.

Of course, you as manufacturers, are very well aware of the fact that in the ordinary steam power plant considerably less than 10 per cent. of the theoretical energy of the coal is utilized, while in lighting plants, it is stated that less than 1 per cent. of the energy of the coal is utilized in the form of light. Here is the field of the engineer and the inventor. The modern gas engine utilizes a much larger percentage of the theoretical energy available, and with increasing use of this form of power, a reduction in the loss of fuel will ensue; and if some means can be devised to utilize a still larger percentage of the energy of the fuel, the period of exhaustion of our fuel supplies will be pushed still further into the future.

Nevertheless, these resources must inevitably come to an end. This significant fact, if thoroughly realized, should impress upon us our duty towards those who are to follow us upon this earth.

Turning to our iron ores, at the present rate of increase of consumption, it is estimated that the known supplies of high-grade iron ores will be practically exhausted by the middle of the present century.

Another of our important minerals is phosphate rock. Of this we have large deposits in the Southern states, and in some parts of the West, which are extremely valuable in the manufacture of fertilizers. These, it is estimated, will be entirely exhausted in about twenty-five years, and representatives of foreign countries are apparently now endeavoring to gain control of them, so that the product may be largely or exclusively sent abroad.

I need hardly refer before this audience to the great and unnecessary waste by fire. The cost of fires in this country, including the property destroyed, insurance, and the cost of additional water supplies, amounted in 1907 to over $450,000,000, or to 50 per cent. of the value of new buildings erected. This amounted to over $5 per cap- water supplies, etc., was estimated at $2.51 per capita, while in the six largest European cities the corresponding loss was 38 cents per capita. Surely, something is wrong when we, who consider ourselves the most enlightened people in the world, allow an annual destruction by fire to constitute a tax about seven times as great as the ita. Property loss alone, not including insurance, corresponding tax in European cities.

The total waste of all our mineral products is said to approximate $1,000,000 per day, or more than one-sixth the value of the total production. In addition to this waste of material is the waste of life. During the past year in coal mining operations alone more than 3,000 men were killed and more than 7,000 injured.

I will not dwell upon the situation with reference to public lands or to lands in general, but will confine myself to the statement that while the fertility of our lands is not decreasing, we are failing to grow as large crops as we ought to grow, largely because we do not appreciate some fundamental principles, such as the benefit of rotating crops, ploughing on contours so as to prevent wash, et cetera.

The average product per acre from 1897 to 1906 was 13.8 bushels of wheat in the United States, 28 in Germany, 32.2 in the United Kingdom; and somewhat corresponding figures in other crops.

There is also great waste and damage due to animals and insects. The Hessian fly in one year did a damage of $24,000,000; the San Jose scale of $10,000,000. In Texas there is one colony of prairie dogs which covers 25,000 square miles and contains a population of 400,000,000 dogs. Two hundred and seventy dogs eat as much grass as one steer, so that this district, if the dogs were exterminated, would support one million and a half head of cattle.

With reference to the waters, these constitute a resource more permanent and inexhaustible than the others. Whatever men may do, rain will continue to fall upon the surface of the earth, but it is not the less important to conserve these waters, and to take such precautions as will allow of their utilization to the fullest extent. The statements which have been made with reference to the ex-

haustion of our fuel supplies clearly indicate that in the years to come water power will become more and more important as a national asset. Indeed, as the fuel supplies approach exhaustion, it is probable that our streams will be utilized for power to the greatest practicable extent. In this utilization it is of great importance that extremes of flow should be reduced as much as possible, so that the waste of water in floods may be made a minimum. With reference to the damage annually done by floods, so far as statistics are at hand they indicate that this damage has been increasing in recent years, having risen from $45,000,000 in 1900 to $118,000,000 in 1907. Even a small effect of the forests in regulating flow might easily reduce the flood damage sufficiently to pay in a single year for the expenditure involved. The Merrimac river, for instance, when at the highest flood discharges about seventy times as much water per second as it does when at its lowest stage, and about ten times as much as at its average flow during the year. No water-power plant attempts to use the maximum flow, and few attempt to use an amount of power greater than the flow of the stream during the lowest six months. Supplementary steam power is provided for the use during periods when the stream will not afford water enough to generate all the power that can be generated by the water wheels. Even at the present time, with a comparatively low price for coal, any increase in the regularity of the flow of a stream used in this way for power would be a considerable gain. Much more will be this gain as our fuel supplies approach exhaustion. This may not worry us, but it will probably seriously worry our descendants.

The regularity of the flow of streams may be increased by two means, first, the construction of reservoirs, and second by the preservation of the forests. The flow of the Merrimac River is largely regulated by numerous large lakes in its drainage basin, some of these being utilized in the interests of power. In other parts of the country where there are no lakes, the streams are much more irregular in their flow, and any reservoirs must be entirely artificial; and as time goes on such reservoirs will be constructed to an increasing extent, but to bring about any great regulation of flow by means of reservoirs, except on a small stream, would involve an immense expense, probably beyond the means of any agency except the general government.

The other agency available for conserving the flow of streams consists in the preservation of the forests. In this respect it is a source of great satisfaction to those of us who believe in the value of the forests, that this Association has taken so wise and far-seeing a position in advocating the passage of some bill providing for the acquirement by the general government of forest reserves upon the mountain slopes. No other organization of power users made so strong or effective an impression at the recent Conservation meetings.

There has recently been considerable discussion as to the real value of forests in regulating the flow of streams. Let me endeavor therefore to state to you briefly what I conceive to be the true state of the case. There are many circumstances which affect the flow of streams and their regularity. Chief among these, aside from natural or artificial reservoirs, are the amount of annual rainfall and its distribution throughout the year. The amount of annual rainfall varies from year to year, being in some years nearly double what it is in others. Its distribution throughout the season also varies, and in some years there are enormously heavy storms while in other years an equal amount of rain may come more gradually. Suppose that during one year the rainfall comes principally in the winter and spring, with very little during the summer and autumn. In such a case a very large proportion will run off in the spring floods, while during the low-water season the flow will be very small. The following year the condition of things may be reversed, with a comparatively small rainfall in the winter and spring, and a large rainfall in the summer and autumn. In this case, the flow during the year will be much more regular.

Meteorological phenomena are exceedingly variable and uncertain. It is therefore easy to understand why the influence upon the flow of the stream of the elements referred to should be very great and very variable. Extremes of flow, whether great droughts or heavy freshets, which occur only at long intervals, perhaps once in a generation, are generally due to exceptional meteorological conditions, either exceptionally heavy rains coming at a time perhaps when the ground is frozen, the result being a great flood, or an extreme and long continued drought, such as occurred last summer. These meteorological influences are so strong that they mask the effect of the forests so far as extremes of flow are concerned. So far as a casual scrutiny of the records of flow indicate anything, our New England streams do not appear to be subject to greater floods or to periods of lower water than they were twenty or fifty years ago. We have no information, however, with reference to the amount of forested land on the watersheds at those periods. Notwithstanding the recent cutting of the timber in the mountain regions, it is very possible that taking a large drainage area like that of the Merrimac River, the percentage of wooded land may not be very much less than it was fifty years ago. The statement, then, that our New England streams are not subject to greater extremes of flow than formerly, must not render us oblivious or uncertain as to the effect of forests. If we could analyze more carefully the records of flow, we might—and very likely should—find that in a true sense the streams are more variable; but such an investigation would be very lengthy and very costly. Such a study has been made, however, by Mr. Leighton of the Geological Survey with reference to the Tennessee River. He has not been content to ascertain whether in recent years the floods have risen higher and the low water fallen lower than during the previous period, but he has studied the rainfall records as well and has counted the number of rain storms of sufficient magnitude to cause a flood occurring on a water shed and has compared these results with the

resulting stage of the river. In this way he has taken account of the rainfall and its distribution in a manner which is probably as complete as it is possible to make it. In other words, he has endeavored to ascertain whether a given rainstorm now produces a greater flood than it would have done formerly. His investigation has shown that the Tennessee River is, as a matter of fact, more variable than formerly. During the last half of the period studied the number of days of flood was actually less than in the earlier half of the period, notwithstanding the deforestation which has recently taken place. Many would conclude from this that the stream had been becoming more regular in flow, and that the cutting of the forests had done no harm. But this would be an erroneous conclusion, for the rainfall has also been less in the latter period, and the diminution of the rainfall has been much more than sufficient to account for the diminution of the floods, the actual result being that the floods have increased 18.75 per cent. in the last seventeen years as compared with the seventeen years previous.

New England manufacturers using water power, therefore, must not expect a sudden or perhaps even an at once measurable increase of their power should the government acquire forest reserves in the mountains. While the effect would undoubtedly be a real one, such immediate change as there would be might very likely not be perceptible to ordinary observation. The question is a much larger one than this. It is a question of a great national policy. We know how rapidly the consumption of wood is increasing and the supply decreasing. We know that we are taking from our forests over three times what they produce, and in addition that there is great destruction by fire. The government should take the lead and set the example of a proper forest management. Whatever the government may do, however, the necessary results will only be brought about by cooperation between the government, the states and private owners. By the establishment of forest reserves in the mountains, the Forest Service will be able to demonstrate to owners in different districts the benefits of wise forest management, and will be able to cooperate with them on the ground in using similar methods in their own forests. The government, also, for the same reason, will be able to restrict forest fires, not only on the government reserves but on private lands. The effect of such reserves, therefore, will be much larger than in proportion to their area, and by wise management and cooperation with private owners not only will erosion of the ground be prevented and the flow of the streams favorably affected, but the timber supply will be conserved.

It is not in general realized, perhaps, that in the government forests the loss by fire is only one per cent. of the loss in privately owned forest lands, although the area of government forests is but one-fifth of that of the privately owned forest lands. In other words, the loss by fire in private lands is twenty times as great, relatively, as in the government reserves.

Of course it must be realized, and attention called to the fact, that the only justification the government has for the purchase of forest reserves is to protect the navigation of streams. In this respect the forests on the mountain slopes are of the greatest value, for it is on these slopes that the erosion is greatest. In the Southern Appalachians the soil is thick, and where unprotected by a forest cover, large quantities of soil are washed into the streams and gradually carried to the sea. In New England the soil is thin, and the effect is of a somewhat different nature. Where the forests are thinned out, the winds uproot and destroy many of the remaining trees and it takes a long time for the growth to be renewed. In some places it does not seem to be renewed at all under such circumstances. Also the destruction by fire is likely to be very great. In the single year 1903, 84,000 acres were burned over in the White Mountains, and some 25,000 acres in the year 1908.

Finally, authorities are pretty well agreed—indeed, they may be said to be almost unanimous—as to the desirability of protecting the forests on steep mountain slopes in the interests of navigation. At the Tenth Congress on International Navigation, held at Milan, in 1905, this question was discussed, and the reporting engineers were unanimous as to the benefits of the forests. As this foreign testimony may be of interest in connection with this discussion, showing as it does the dependence of the interests of navigation upon the preservation of the forests, it may be worth while to give extracts from some of these reports.

On the adjournment of the morning's session the members lingered in the exhibition hall where they found the machinery in operation and the representatives of the exhibitors ready to explain their exhibits.

At the afternoon session papers were presented as follows:

Reasonable Legislation Affecting Child Labor.

LEWIS W. PARKER, Greenville, S. C.

I appreciate that in the public mind the impression is general that manufacturers employing children in their factories are necessarily opposed to child labor legislation. Such an impression is probably justified from the fact that the manufacturer is necessarily conservative and hesitates to make changes in his methods. Owing to the fact that the cotton mill is almost the sole industry in which all members of a family—father, mother, boy and girl—can be profitably employed at the same time in different departments, child labor has been for generations more general in the cotton factory than in any other class of industry. Unquestionably, the extent of this employment in times past has been too great, and has been a cause of just criticism. In some foreign countries and in some sections of this country, there has been such progress in the industry that legislation which has caused a correction of the evil to a great extent has been practicable. In other sections of this country, particularly of the South, it

is complained that legislation has not been as yet sufficient to correct the evil. I do not wish to be understood as opposing legislation which is reasonable, and which, under the conditions confronting the industry in a particular locality, would not work so great a hardship as to more than offset any consequent gain. I think my position is in accord with that of the great majority of those engaged in the same industry, namely: that we have no opposition to legislation which can correct the evil without preventing the development of an industry needed in, and necessary to the development of the community itself, and which is bettering the condition of the very ones sought to be affected.

Our country is great in extent and great in its industries. The same industries are, however, carried on in different parts of the country under very diverse conditions. While cotton manufacturing is confined, to a great extent, to the states on the Atlantic seaboard, yet the conditions at the present time affecting this industry in the northernmost of these states are wholly different from those in the southern part of the slope. In the New England states the industry has shown constant growth for several generations. In the Southern states, while not in its initiation of this generation, yet the development to an appreciable extent is of the present generation. In the New England states at the outset of the industry and for several generations, the employes were natives, being drawn from the communities adjacent to the factory. In the progress of time conditions have changed in these states, so that the native employes have been replaced by the Irish, who in their turn were replaced by French Canadians, who in their turn have been replaced by Italians and Portuguese, who again are being largely replaced by other nationalities, particularly Poles and Slavs. This series of replacements was a natural progression, and but illustrates the benefit to a community of an industry giving employment to those entering upon the first stages of industrial employment.

The natives went to the mills because these industries offered greater inducements in the way of wage and comfort than enjoyed in their former lives, particularly on the farm; but with advantages of this higher wage and greater comfort, and enabled to make accumulations of savings, the New England natives succeeded to higher things than being cotton mill operatives, and drifted from the mill into lives of more comfort and into work offering greater social position.

As yet, in the South, the employes of the mill are practically wholly drawn from the native population, that is, from those who, living nearby, have been unfortunate in their work or have found their work not sufficient to yield them a comfortable living, and have therefore welcomed the factory as an advance in their lives. A fair percentage of the Southern employes have come from the immediate vicinity, for the reasons stated. A large percentage, however, have been drawn from the mountainous sections of the two Carolinas, Georgia, Tennessee, Alabama and Virginia, where the population for generations had lived in a most primitive and uncomfortable fashion, barely eking out a living by the cultivation of the soil, or by doing such work as could be done within the short space of the summer months. The fact that the cotton factory gave employment to all members of the family, and therefore insured a comfortable living during the whole year, was the attraction. The father could not upon removal to the factory do work which would yield sufficient income to support the family. He had, by years of ease in the country, acquired habits which would not be in accord with the quickness of action needed in factory life. In agricultural and other rough labor, his hands had become gnarled and his fingers were without that deftness necessary to the tying and handling of small threads, the basis of cotton cloth. The children, however, had not as yet either acquired these habits of indolence, nor had their fingers lost their deftness, so that the child could do the work in the cotton factory which the parent could not. The parent must therefore expect to do the more or less menial work around the factory, and to do the heavy work requiring the strength of a man. The younger members of the family would readily find employment in the manufacturing proper, to which they were suited, while the parent was not. The cotton factory therefore fulfilled the needs of the condition, and drew the whole family from their former home to an industrial life.

In the New England states this was, as stated, originally also the case, but the New England states having had generations in the industry, the relation of all members of the family to the industry is not so marked now as it is in the South. Possibly, and indeed probably, another, and certainly succeeding generations, will show the same evolution of the family in the South that was shown in the East, and in the South as in the East, we shall probably see in subsequent generations the descendants of those now engaged in cotton manufacturing, rise to other work higher in both social and industrial estimation. Whilst it is a well known fact that the industry in New England in its early stages had only native employes, I have not at hand the statistics verifying the statement, as I have in connection with the industry in the Southern states, and particularly in that state, to wit: South Caorlina, with which I am familiar, and in which the mills with which I am connected are situated.

It appears that while there is a large disproportion of bread-winners among children ten to fifteen years of age in the South, as contrasted with New England, this disproportion is due altogether to the large percentage of agricultural laborers and the percentage of children employed in all other occupations than agriculture, including the factories is considerably less than employed in the New England states on an average. In the South, as stated, there being but one source of employment, the children are congregated in the mills. In New England, with its diversification of industries, the children are scattered in various industries and do not show the same percentage of employment in the cotton mill industry.

The statistics show the facts, namely, that in the South, cotton manufacturing offered to its native people the same inducements which were

offered a half a century ago in the New England states to their native people with this difference; that in the South there is at this time no competing industry. In the New England states there were developing competing industries at the same time as cotton manufacturing developed.

A study of the statistics with reference to cotton manufacturing in New England shows a steady decrease in the percentage of illiteracy among the operatives, as well as a steady decrease of the percentage of children in the mills. It is therefore interesting and of value to see whether or not there is evidence of such a reduction of percentages in the Southern mills also. Certainly there is in the percentage of children employed, for table 30 of the bulletin referred to, giving the average number of wage earners under sixteen years of age employed in cotton factories in the two years 1900 and 1905, clearly shows this percentage of reduction, as now illustrated:

	1900	1905
North Carolina	7,129	8,212
South Carolina	8,110	8,835
Georgia	4,500	5,406
Alabama	2,437	3,094

In other words, the increase of wage earners under sixteen years of age was very slight, while the industry itself had practically doubled. In South Carolina there is shown an increase of only 725 children, or 8.9 per cent., whereas the spindleage had doubled and the opportunity of employment therefore correspondingly increased. Contrast the 8.9 per cent. increase with the increase of children under sixteen from 1890 to 1900, when the increase was 267.9 per cent.

In the report of the department of labor of South Carolina for 1907, the number of children under sixteen in cotton factories is reported as 8,121, as against 8,835 in 1905, illustrating the continuance of the tendency towards reduction of the number of children in the industry.

That the percentage of illiteracy amongst cotton mill operatives is also decreasing is evident from the reports of the State Superintendent of Education of South Carolina, which, while not dealing specifically with the question of illiteracy, does show the percentage of attendance of children in the various communities of the State.

In the cotton mill communities the percentage of attendance of children is shown to be larger than in the agricultural, or non-cotton mill counties of the State. Necessarily, the resultant effect will be to show in subsequent years a decrease of illiteracy in the cotton mill communities, as compared with agricultural communities of the State.

This is natural, for with practically each cotton mill in the State there is connected a school of the best character, running eight to ten months in the year, in contrast with the public schools of other communities running from four to seven months.

I feel confident, therefore, that it can be said that the same evolution which took place in the New England mills is taking place in Southern mills, namely, that the population of the mill villages is being steadily brought to a higher and better condition of life and of education.

I fully appreciate the strength of the argument of those who contend that it is unfair to one community that conditions of labor should exist in another which tends to make an unfair competition. I appreciate the fact that in the development of the New England industry a competition of cheaper labor and of child labor in the South does expose the New England manufacturer to disadvantages, but these disadvantages are consequent upon the new industry in the South, and in the development of that industry it will be gradually eliminated until the two communities are on a par, with the exception of such results as arise from natural local advantages.

While not opposing legislation gradually advancing the age of children in employment in Southern factories, this legislation must be in reason with the conditions confronting the Southern mills; namely, that they are offering to a population heretofore without advantages, advantages consequent upon steady employment at a fair wage, and that it would be unfortunate that any legislation should be had which would discourage the reasonable attraction of the cotton mill for the family living under adverse conditions.

One of the problems of the Southern manufacturer has been that of bringing the employes to a realization of the advantages and necessity of education. The Southern manufacturers have therefore generally taken the position that a mere exclusion of the child from the mill, without an inclusion of it into the school population, was of no advantage to the community, and that therefore a compulsory educational law should be a precedent to an advanced child labor law. This has been the position steadily taken by them for a number of years, and it is interesting to note the progress of the growth of sentiment in favor of compulsory education in Southern communities.

There has been in the South within recent years, legislation raising the child labor age limit, as also reducing the number of working hours. While this legislation is not yet generally, in limits, up to the stages reached in New England legislation, there is nevertheless continual progress in the direction of improvement. It must be remembered that the New England legislation is the resultant of half a century's progress, whereas Southern legislation is but of a few years' growth. While it is not to be expected that Southern legislation would be deferred in the development of the industry for an equal length of time with the deferment in the development of the New England industry, yet the Southern manufacturers have to meet the same conditions which the New England manufacturers met. In the early stages of the development the progress of legislation cannot be therefore unreasonably rapid. In a ten years' development Southern labor legislation has advanced to a point where New England legislation was not exceeding ten years ago; and if at times the Southern people appear to those in other communities as complacent with regard to labor conditions, it must be recognized that on their part they are studying and viewing the results of the development of an industry which is doing much for their betterment. There is therefore natural

hesitation in advancing beyond reasonable limits in legislation, but there is every incentive why such legislation should advance as conditions justify it. As shown, the population in the mills is native; it is of the same character as the population of other sections of the State. There is every sympathy on the part of these other communities with the employes of the mills, and there is a general recognition of the fact that the condition of these latter has steadily improved through connection with the mills.

Practically every student of conditions has agreed that the best mill conditions, and the best character of employes, are to be found in the mills longest established, showing that there is a gradual and continuous improvement and not a degradation of the employes. Recognizing this tendency to improvement, there is forced the conclusion that legislation must be in accord with recognized facts and that no legislation is reasonable which would tend to destroy or impede the industry. Extreme child labor legislation at this date would simply prevent the removal of families, who would be benefited by removal, to the mills. There is not as yet a second and third generation of employes in the industry who show the evil effects of factory life, but on the contrary the first generation in the factory shows a steady development, in contrast with previous conditions. When at any time questions have to be met consequent upon succeeding generations, it will be found that there is a recognition of the same social law in the South that there is in other sections of our country. Legislation with regard to factory conditions must therefore be in line with local conditions, and legislation is only reasonable which recognizes a diversity of such conditions.

Being myself from the South, I would congratulate the New England members of this Association upon the fact that they have been able to stand successfully the advancements made in legislation upon various labor questions, and I believe that there will be found equivalent advancement in Southern legislation as rapidly as the conditions of the Southern industry justify it.

Mr. Parker's address was a valuable contribution to a subject of widespread interest and discussion, not only in strictly mill circles but with the general public. The yellow journals and some of the muck-raking magazines have so distorted the facts in regard to the question of child labor that Mr. Parker's frank and sane statement of conditions in the South and the attitude of Southern manufacturers is most interesting and welcome. Mr. MacColl made some inquiries in regard to the present educational requirements and in his reply Mr. Parker stated that the leading manufacturers and prominent citizens throughout the South were most earnestly in favor of compulsory education, but were frequently thwarted by the politicians. In reply to a question as to the success of the employment of negro labor in the mills, Mr. Parker replied that the experiments in this direction had not proved satisfactory and that manufacturers generally discourage employment of negroes.

Improvements in Lighting Large Textile Manufacturing Areas with High Efficiency Lamps.

A. THATCHER HOLBROOK, 607 Boylston St., Boston, Mass.

The multiple or enclosed arc lamp alternating or direct current of various sizes, ranging from 4 amperes alternating current, consuming 300 watts, to 7.5 amperes on direct current, consuming 900 watts. These lamps are efficient to a ratio of about 1.5 watts per mean lower hemispherical candle power, and the character of the illumination is reasonably satisfactory. The lamps, however, must be trimmed every 150 hours, and the illumination is unsteady.

The Cooper-Hewitt lamp is a mercury vapor type which is used to some extent, and is generally considered to be more of a success on direct than on alternating current. These lamps can be obtained to operate either two in series on 110 volts, or four in series on 220 volts, according to the installation. This lamp has a very long life and is very efficient in that the consumption of current in comparison with the candle power is .7 watt per mean lower hemispherical candle power. The lamp, however, gives a greenish or yellowish light which is found very difficult for matching colors. In mills where this feature is not considered important these lamps can be used to great advantage and with considerable satisfaction on the part of the mill.

The Nernst lamp gives a light of a character very nearly approaching daylight, of excellent quality, is extremely steady, can be operated either on alternating or direct current in large units or 220 volts, is manufactured in sizes suitable for the proper illumination of large areas, the renewals have an average life of from 600 to 800 hours, and the maximum distribution is received in a downward direction.

All of these characteristics make the Nernst lamp particularly suitable for the lighting of large cotton manufacturing areas, and the lamp has been accepted and installed under these conditions for a number of years. Recent developments in the art have improved the mechanical structure of the lamp materially.

The Nernst lamp was introduced in the fall of 1901, and was first exhibited at the Pan-American Exposition in Buffalo of that year. Since then the lamp has had wide distribution. In its use among cotton mills, the characteristics of the lamp regarding quality of light have made it particularly desirable. In woolen and worsted manufacturing plants it has been especially desirable, and also in

printing establishments where colored shirtings are made. The collar and cuff manufacturers of Middle New York have also been benefited by the lamp, and the operators are successful in turning out a larger quantity and better quality of work when the room is lighted with large units than was done under the old system of individual lamps for each machine.

The use of small units as against large units always shows to the disadvantage of the former in mill work. The illumination given by small units is so small that the lamps must be hung low and are consequently constantly within the range of vision of the operative. As the radius of illumination is proportionate to the amount of light emitted, it will be noted that the spaces between lamps have a very low illumination intensity and produces a spotty effect which is undesirable. In the case of large units the intensity of illumination is so great that the lamps are placed entirely outside of the range of vision and diffuse this illumination so that an equal distribution is obtained of sufficient value to make good work possible. Daylight is diffused in this manner, and where good diffusion is possible freedom from eyestrain will prevail.

The use of general illumination where fine work and delicate machines are in use is more appreciated at the present time than it has been in the past. The accepted idea of an individual lamp for each machine has been done away with by the use of large units and a more even and equitable distribution of light has been obtained.

The question of matching colors under artificial light is one that has never yet been determined by physicists and it has been found that a combination of colors can be obtained which can be matched under any form of artificial light. The use of special lamps to bring out the abstract colors is no longer absolutely essential, and the lamps which give the colors a pleasing appearance are the ones most acceptable at the present time.

In taking up the various large areas in cotton mill work, I will endeavor to give some detailed figures showing the use of Nernst lamps for lighting the various rooms in consideration. The various sizes of Westinghouse Nernst lamps as manufactured at the present time are as follows:

1 glower, 132 watt.
2 glower, 264 watt.
3 glower, 396 watt.
4 glower, 528 watt.

These wattages are based on the consumption of current at 220 volts alternating or direct current. As the lamps operate at .6 amperes, it would be seen that the current consumed would be more or less than this figure, dependent upon the line voltage.

The following figures are given for these type lamps, using clear glassware, which is most acceptable in mill work, the lamps being furnished with a flat metal shade to insure proper distribution and good reflecting surface.

132 watt lamp, 156 candle power.
2 glower lamps, 345 candle power.
3 glower lamps, 528 candle power.
4 glower lamps, 745 candle power.

It will be noted that the mean hemispherical efficiency of these lamps will range very close to 1.1 per mean lower hemispherical efficiency, which is extremely high. As compared with the old type of lamps in service, it will be noted that the incandescent lamp is 3.1 watts per mean lower hemispherical efficiency, the multiple A. C. arc lamp, 110 volts, is 2.53 watts per mean lower hemispherical efficiency; multiple D. C. arc lamp, 2.25 watts, per mean lower hemispherical efficiency; series A. C. arc lamp, 1.19 watts per mean lower hemispherical efficiency, and the D. C. series arc lamp 1.3 watts per mean lower hemispherical efficiency.

You will note how important it is to obtain a lamp having a high efficiency and this means a saving in current not only in the consumption of current, but in the capacity which is provided for the lighting equipment, and where these considerations prevail power is available for other purposes, which, under less favorable conditions, would be tied up for lighting with no material benefit to the corporation.

The question of up-keep is important and it will be noted that large units rank about uniform in the cost of up-keep, which is about .006 per killowatt hour. As these figures are proportionate, it will be seen that a lamp having a high efficiency is more suitable than the low efficiency lamp, beyond the saving in current, as the keep-up is a constant source of expense which must be met at all times.

At the Cocheco Manufacturing Company, at Dover, N. H., there is a very satisfactory installation of old style, three glower Nernst lamps, lighting the No. 1 mill, the weaving in No. 5, and the packing room and superintendent's office No. 4.

The lamps are equipped with flat metal shades and clear globes, and as you will note from the photographs, the distribution is excellent.

The spinners and weavers have no cause to complain about the illumination, and the back alleys as well as the fronts of the spinning frames are amply illuminated.

You will also note the photographs given of the weaving room of the Naumkeag Steam Cotton Company at Salem, Mass., and the finishing room of the same company. The position of the lamps is plainly shown, and the proportion of one lamp to each eight looms is almost uniformly maintained.

Since these installations were made, the Nernst lamp has been completely redesigned for the purpose of increasing the efficiency, and this has been obtained by mechanical as well as chemical advance. The component parts of the glower have been subjected to revision and the addition of other material which enables the mass to stand up under higher temperature and consequently give a greater volume of light proportionate to the current consumed. This has rendered necessary the redesigning of the ballast structure, which has been made by using a larger envelope and

heat radiators which rapidly carry away the heat generated by the ballast units. The result has been a quicker and more uniform starting, and the lamps come up to candle power without the overshoot which was so noticeable in the old lamp.

While the rest of the lamp was being redesigned, it was found that the heater filament also could be improved, and this was done by providing a flat heater circuit instead of the well known types wound with platinum wire. The result of the change of this design has been to apply the heat to the glower more quickly, which has resulted in the lengthening of the life of these parts.

It will be found in going over the lamp that these changes are decidedly important and interesting, particularly as it shows that the lamp can be maintained at a very much less cost than the old lamp, which is in itself a very desirable point. Most mills find that the cost of currency is extremely low. Some mills find that current can be manufactured for as low as one cent per kilowatt hour. Where this obtained the question of maintenance must be seriously considered, and a unit which costs more than .006 or .007 mills to maintain should not be considered, as the cost of maintenance very rapidly offsets the gain in efficiency. In other words, with a lamp which has a high efficiency, the renewals should be low in proportion and long in life in order to make the gain in efficiency appreciated by the user of the lamps.

Taking the old carbon filament incandescent 16 candle power lamp as a basis, the lamp consuming 56 watts, at normal voltage, and having an average useful life of 830 hours, with the cost of the lamp at 20 cents, including handling and expressage, it will be shown that the cost of renewals are .0043 mills per kilowatt hour, and including current at one cent per kilowatt, a total cost of .0143 per kilowatt hour. Assuming that each lamp burns 1,000 hours, during a year, it will be shown that each lamp will cost 80 cents for current and renewals. If the use of one and one-half lamps per single loom is maintained, it will be shown that the cost of current and renewals per lamp is $1.20 per year, and for eight looms is $9.60 per year. Assuming that one Westinghouse two glower lamp will successfully illuminate eight looms with current manufactured at one cent per kilowatt, it will be shown that the cost for current and renewals will be $4.16 for eight looms, or 54 cents per loom, as against $1.20 above given.

If a more efficient incandescent lamp is used, one consuming 3.1 watts per candle, or 49.6 watts per lamp, with an average useful life of 450 hours costing the same per lamp as in the former case, it will be shown that the cost per lamp per year is 94 cents, or $1.41 per loom, which does not justify the efficiency. It therefore shows conclusively that this point must be carefully considered where artificial lighting is used, as in many instances the cost of production can be greatly decreased by a change in the system of lighting, leaving out entirely the increased production due to good illumination.

There are at the present time incandescent lamps of various types which have come out recently which are still more efficient than the old carbon filament lamp, but on account of the delicacy of the construction and their present high cost make them absolutely unsuitable for mill lighting, as the jar of the weaving room and the vibration of operating soon render useless the delicate filament which has been employed in order to obtain this high efficiency.

There was some discussion of Mr. Holbrook's paper by Sydney B. Paine, of the General Electric Co., who took exception to some of the statements regarding arc lighting systems in mill service. There was also a lively discussion regarding the advantages of the Tungsten and Nernst lamps in textile mill work.

Mr. McArthur, agent of the Pepperell Mfg. Co., spoke of his experience in the use of various lighting systems in his plant. He spoke of the matter of vibration as an objection which should be overcome and Mr. Paine explained that there was now on the market a successful shock absorber.

J. W. Lindau was unable to be present and his paper was read by C. P. Slocum.

Scientific Methods in Warp Sizing.

J. W. LINDAU, 26 Broadway, New York City.

Corn is the most valuable crop grown on American soil; in quantity and value, it is greater than all the other crops. The year's crop (1908) was nearly as large as the great crops of cotton, hay and wheat combined. The enormous size of the corn crop can better be appreciated when one considers that a fluctuation of one cent a bushel means to the farmer twenty-six million dollars ($26,000,000). The crop of 1908 was worth $1,615,000,000. At the Paris Exposition, the United States exhibited 108 separate and distinct products made from corn. Corn enters into the manufacture and composition of products in as wide a range as from rubber shoes to our daily bread; from chewing gum to dynamite; from bon bons to battle ships. In this day of commercial economy, no part of the corn plant is permitted to go to waste. The grain, husks and stalks all fill their important and respective missions in adding their bounties and blessings to America, the "Land of Corn."

The credit for this commercial product belongs to seven great states in the Union, Illinois, Iowa, Kansas, Nebraska, Missouri, Indiana and Ohio; these comprise the territory familiarly known as the "Corn Belt." Illinois leads all the other states in the yield per acre, as well as in the amount of acreage and production. The latter amounts to approximately one-fifth of the entire crop of the United States. Of the total crop, however, only seven per cent. is used for export purposes and about twelve per cent. is consumed by domestic industries. Of the consumption for domestic in-

dustries the Corn Products Refining Company consumes approximately one-sixth for the manufacture of corn starch and corn syrup and the balance is required by the fermentation and milling industries.

In the manufacture of our products from corn the corn is first passed through a cleaning and separating machinery and then delivered to the corn bins and from there to the steeping tanks where it is soaked in warm water, bringing about a softening of the kernels which permits more readily a separation of the germs, hull and starch of the corn. When the corn is properly steeped, the mass is then conveyed to the so-called "separators" which are huge, cast iron vats of semi-cylindrical shape, and in these vats the separation of the germs is conveyed with almost mathematical precision, the operation being at once an extremely simple and clever one. This separation is one of the early inventions of Dr. Behr and has perhaps done more than any other invention towards making the corn starch and corn syrup industry commercially possible, as by this means corn oil was produced, and it has enabled the manufacturer to eliminate the corn oil from his starch. The process in theory is a simple one and is based on the fact that the germs which contain a large amount of oil rapidly rise to the surface when suspended in the mass of ground corn and starch milk. The process is a continuous one, the ground mass being introduced at one end of the apparatus, while the germs are discharged at the top and the ground corn plus the starch milk at the bottom of the opposite end. The germs thus liberated are repeatedly washed to remove any adherent starch. They are then delivered to the germ drying plant where they pass through revolving steam driers and are then conveyed to the oil plant. In this plant the usual practice is followed of extracting the oil by hydraulic means, the result in products being corn oil and the residue corn oil cake, the latter belonging to the class of animal feeding stuff, as do cotton and linseed cake, but exceeds both in nutritive value because of its digestibility.

Up to the time when the manufacturers of corn syrup entered upon the manufacture of mill starch, the textile trade depended for its requirements, almost entirely, upon potato starch, imported from European countries. The small starch factories located in this country satisfied but a small share of the demand. The corn syrup manufacturer, because of his large grind, was able to produce commercial mill starch at such a low figure and containing as it does such great starch value, that it replaced, with the improved method of manufacture, to a very large degree, the European product, the manufacture of which has grown into one of our most important products.

The "green starch" is removed from the "tables" and diluted with water until it forms a thin starch milk, which in the case of corn starch is refined very carefully by a number of well regulated operations. It is then deprived of the bulk of water, and the starch now containing between 40 and 50 per cent. of water, is introduced into drying kilns. It is then put up in the various forms demanded by the trade.

From the powdered starch, the dextrines are made up by a process of calcining; a number of grades being produced, running in color from a pure white to a dark yellow, such as white, canary, and dark dextrine, British gum, etc.

It is now almost one hundred years since Kirchhoff announced his epoch making discovery that starch could be converted into a sugar, but while the manufacture of corn starch is an industry of long standing it was not until after the Civil War that experiments were started to make sugar from corn, the cheapest and most valuable source of starch in this country. These experiments were successful, and such products known as grape sugar and corn syrup were made, comparing more than favorably with the sugars and syrups made from potato starch in Germany. The industry grew rapidly, until in 1884 the importation of potato syrup and potato sugar or grape sugar was very materially decreased and in turn the exportation of corn products assumed large proportions. Since that time it has grown until it is now one of our most important industries.

Returning to the manufacture proper of corn syrup and corn sugar in the factory. The conversion is carried out by stirring the "green starch" with a large body of water and subjecting this mixture to a high heat under pressure, the process being an hydrolytic, that is, the starch molecule takes up a molecule of water under formation of dextrose. We add to the water a very small amount of hydrochloric acid for the purpose of inciting and facilitating a catalytic action.

Right at this point your attention is called to the fact that corn syrup or glucose is a manufacture from starch and not a by-product of starch, which seems to be a popular belief, and also to the incorrect description of the manufacture of glucose, as found in most books on chemistry, the statement being made universally that the starch is converted into glucose by hydrochloric acid. The fact is that the acid in its extreme dilute state plays only the role of the catalyser. The conversion of the starch is performed in large vessels, six feet in diameter and about twenty feet high, made of hammered copper one inch in thickness and called "Converters." By varying the temperature and time the action on the starch is changed at will and different products result. As soon as the conversion has been carried to a desired point, as determined by tests, further conversion is arrested by releasing the pressure and neutralizing the traces of hydrochloric acid in a mixture with soda ash practically to a neutral point. By the neutralizing, sodium chloride or ordinary table salt is formed, which in no wise effects the taste of the corn syrup, as it is present, of course, only in small quantities.

From the neutralized, converting starch, now an almost white liquor, is run through filter presses, which eliminate the impurities. After the filtration, the corn syrup liquors are sent to the vacuum pans, where they are concentrated to the required density, varying from 42 to 45 degrees Beaume.

The Mill Yard Transportation Problem.

DAY BAKER, 84 State St., Boston, Mass.

Not only are the problems of transportation encountered in handling the actual raw material, material in process, and the finished goods, but in the many contingent parts of mill-work there also arises numerous calls for transportation of some character.

Raw material, if not delivered by the railroad direct into the storehouse, must be carted there.

Perhaps it is then necessary to team it to the picker room, to start it on its long journey through the course of manufacture.

After being spun into yarn, it may be necessary to transfer it to a somewhat distant mill.

The goods being woven may have to be carted to the bleachery, the dye house or the finishing departments, and from these to other departments or the storehouse, and perhaps later to the freight house.

Not every mill is so fortunate as to have its coal delivered from the railroad cars or boats direct to its coal sheds or boiler rooms, and therefore many mills are confronted with the additional problem of the transfer of coal from railroad lines and wharves to their own storage, and from there to their boiler rooms, many mills making two, and some, three transfers.

After the process of combustion, the remnant of the coal (the ashes), must be carted to such places as are being filled, or to the dump.

The lumber for the shipping boxes—that does not come in on wings—it requires hauling to the carpenter shop and from there as boxes to the finishing room or shipping department.

The barrels of dye and bleaching materials will not roll themselves to the storehouse, and from there to the dye works or bleachery; they must be teamed, and their weight is such that they make heavy loads.

Lumber must be moved to the various places around the mill yard where repairs are going on, or if construction work is in progress, bricks, lime, cement, crushed stone and gravel must be carted.

These are some of the many problems in mill transportation that confront the superintendent.

THE HORSE-DRAWN PERIOD.

Years ago almost the only means employed in transportation in the mill yard was the slow plodding oxen, and even now you will occasionally find a few yoke of them slowly drawing their cumbersome trucks loaded with raw material or finished goods.

Later as the world progressed and speed became one of the requirements, the more flexible and faster moving animal, the horse, was introduced for service around the mills. The horse, man's faithful friend, has done great work, but his day is fast going by, for with the keen competition of the twentieth century, we are calling for an increased amount of work in a given time, less manual labor, a speedier transfer of goods, and improved hygienic conditions around our manufacturing communities.

According to one of our best writers on health subjects for the masses, 40 per cent. of the disease and deaths accounted for by our hospitals may be directly traced to the horse, who aided by the wind, the fly and the rat, scatter broadcast death-dealing germs. (See Appleton's Magazine, May, 1908, "The Horse vs. Health," by Harold Bolce.)

It has also been shown by highest authorities that delays in work caused by sickness or death among employes are a distant economic loss, not only to a town, city or state, but also affect the cost of manufacture. Therefore, I say, for the reasons given above, and for the additional reason that a better and cheaper method has been found, the day of the horse for mill yard work is on the wane.

PROGRESSION IN METHODS.

We no longer weave by hand, nor do we travel by the stage coach, and as the world moves so the conditions around the mills change. Therefore we should no longer cling to the use of brute force for the transfer of heavy weights. The lightning subdued by the brain of man, and harnessed by the generator and motor now stands ready to do our bidding, better, quicker, cheaper, and without the unhygienic conditions which surround the stable and the horse.

In some instances tracks and industrial cars have been installed in the endeavor to better yard transportation, but the work of almost any mill is of such a varied character that the network of tracks required to reasonably cover the routes desired, the cost of laying them, and keeping in repair, more than offset their apparent saving. And then again, it is often desirable to use the mill-yard vehicles around the town or city, outside of the mill property on the public highways. This cannot be done if industrial rail cars are used. Therefore, trackless transportation in and around mills is really what is required.

THE DESIRED VEHICLE.

As vehicles operating around a trackless mill yard and town or city roads must be supplied with power, the nature of the motor is first to be considered. At once gasoline must be discarded, not only on account of the expense of operation and maintenance, but on account of the serious fire-risk involved. Electricity seems to be the most natural power to be considered, not only on account of its cheapness, but because of its cleanliness, safety and flexibility. Therefore, the logical method of transportation for the mill yard is trackless, electrically driven vehicles. As the conditions are trackless, the vehicle used must be self-contained, which means that its power, derived from the generator, must be accumulated in storage batteries; therefore we have given as the desirable method of transportation an electrically driven, storage battery truck.

In considering any method of transportation there are three things to examine: The road, the load and the vehicle. In trackless transportation the road must be accepted as it exists. In mill work the load must be accepted as it is received, and it must be delivered as ordered. These two

factors of transportation are the same, no matter what method is employed. Hills, bad roads, frequent stops and starts, long routes or heavy loads are equal in the demand made on animals or machines of any kind. The third factor, the vehicle, is the only one with which the solution of transportation problems can be made any easier.

Just as the electric street car has solved the problems for passenger transportation in cities, so has the electrically driven power wagon opened the way to a simple freight and delivery system around mill yards.

THE ELECTRIC VEHICLE.

The electric vehicle for trucking and delivery is purely a mechanical proposition. It is a machine. Like other machines it can be built to do a given amount of work in a definite time at a certain cost under any known conditions.

The safely carried load in pounds or tons is the basis of its mechanical design and construction. The specified speed with full load on hard level determines how much power will be required. The specified duration of continuous operation at full load on a hard level determines the amount of energy that must be stored in its battery at one time. This last condition fixes the size of the storage battery. The power and speed required, determine the size of the motor and the gear ratios, while the total weight affects the tire design.

The cost of transportation by electric vehicles can be determined just as logically as the cost of operation of any other machine. It is merely a question of measuring the work and measuring the cost and placing one against the other.

Accurate engineering can be applied to the problems of transportation with greater satisfaction with electric vehicles than with any other type. Electrical measuring instruments reveal, and record if necessary, the condition and performance of storage batteries and electric motors. The cost of producing electricity is a known quantity. The amount of electricity necessary to charge a battery is measurable. The amount of electricity delivered to an electric motor by the battery is a known quantity, or can be measured. The performance of an electric motor is accurately specified for any conditions. Its efficiency is easily determined.

The work of moving a ton a mile per hour on a hard level road is expended in starting it from rest and in overcoming the resistance of the road, the tires, the bearings, the electrical circuits and the air. If the road is not hard or not level of course more work will be required to overcome its resistance, or to move the load up a grade. If it is necessary to start often from rest more work must be done than for continuous motion.

ARGUMENTS FAVORING ELECTRIC TRUCKS.

Among the many arguments which should be considered by the mill operators in connection with electric motor vehicle work over horse drawn trucks is first, the cleanliness in garage and around the yards, the vehicles and the motors driving them, running on very generously proportioned ball and roller bearings, which are sealed, oil and dust tight, only require oiling once every six months, and have not the dirt and hot oil throwing proclivities incidental to the gasoline machine; second, the electric method is far cheaper, requiring a less number of vehicles, therefore less drivers, and the loading and unloading crews are less, or the present force is kept busier; third, while the electric current for the charging of the batteries is figured in all estimates on which this argument is based at 4 cents per kilowatt hour, it is a fact that most mills can operate a small wheel or a small engine during the night, furnishing power to charge the batteries, or taking current from the mill lighting plant before the peak of the load, utilizing power which would otherwise go to waste, thus reducing the cost of current to less than a small fraction of a cent per kilowatt hour; fourth, the flexibility in the handling, light or heavy loads carried with equal ease, the turning of vehicle and backing to freight cars, doors or elevators, and its ability, on account of occupying only 60 per cent. of the space used by the horse-drawn vehicle, flexible steering, and starting and stopping devices, to travel in congested yards or buildings; fifth, it can be run into factory buildings, up elevators, into shipping rooms or freight houses, and onto docks and wharves, all of which places are barred to the gasoline truck by insurance regulations; sixth, and most important, that the money invested in electric motor vehicle transportation will produce a larger dividend, when compared with present horse costs, than is earned in any other portion of the manufacture of textile goods.

PRACTICAL EXPERIENCE IN ELECTRIC TRUCKING.

The facts advanced in the preceding paragraphs are amply justified by the experience of a number of well-known mills of New England which have adopted the electric motor vehicle method. It is perhaps one of the strongest arguments in favor of the motor vehicle to say that all mills with one exception, which have made a primary installation of electric trucks, have after a practical experience, ordered additional machines.

The following statement and estimate were made for one of the most conservative mill operators in New England. The cost of land and a large stable building for the horses were not even considered.

Teaming.

Total cost for 5 years ending Dec. 29, 1907 (not including hired teams for mill coal)	$33,419.49
Of which, the labor of drivers and helpers	24,961.77
Leaving as cost of grain, shoeing, harness repairs, horse renewals	$8,457.72
As this is for 10 horses for 5 years, the cost per horse per year	$169.17

Electric Trucks.

It is claimed that 2 ton electric truck can do 30 miles per day on a single battery

charge, and that it can easily do the work now done by two double teams. One builder claims more than this.

Electric Truck.

Cost complete, including battery, etc. ...	$3,400.00
Estimated cost of charging equipment, to charge 3 trucks	250.00
Spare parts, in case of accident	350.00
Amount invested in electric truck, etc. ..	$4,000.00
For comparison with horses, deduct estimated value of 4 horses, carts	1,000.00
Excess amount invested, say	$3,000.00

Expense of Truck Per Year.

Interest on investment, 6 per cent.	$180.00
Depreciation, 10 per cent. (Batteries and Tires below)	310.00
Batteries, $207. Tires, $235. (Each said to run one year)	442.00
Two men to operate truck, 1 at $1.75, 1 at $1.25	900.00
Cost to operate truck one year	$1,832.00
On the basis of last 5 years cost of teaming, the displacing of 4 horses, 4 men on two double teams, would be	
4 horses at $169.17 per horse ...	$676.68
4 men at same rates as above ..	1,800.00
	$2,476.68
	1,832.00
Saving by the use of one truck	$644.68

If more than one truck is used the saving would be more in proportion.

As a result of the investigation, two General Vehicle Company motor trucks were installed. The mill teaming account was over $6,800 per year, or $569 per month, but by the additions of the first two machines a saving of $266 per month, or $3,200 per year, has been shown. Of course this high rate can hardly be maintained, but a handsome saving can and will be shown in the following years, which will make the truck investment one of the most profitable.

In one of the largest mill corporation plants in the United States, four motor vehicle trucks have been installed, displacing about 30 horses and the many wagons and trucks which it was necessary to use.

In another cotton manufacturing industry a five-ton electric vehicle was installed working ten hours per day, taking the place of three horse-drawn trucks. Later, the enterprising engineer of this mill proposed purchasing an extra battery, putting on a night crew, and operating the truck twenty working hours per day. This has been done, and as a result the entire stable has been dispensed with, and the machine truck is now doing the work which before required seven horse-drawn trucks.

With the advent of the machine truck has come advanced methods in handling the loads which they are called on to carry, and on this portion of the Problems of Mill Yard Transportation, I trust that I may have the pleasure at a later date of presenting another paper.

Just as the electric light has supplanted the candle, kerosene oil and gas, and the electric car displaced the stage coach and the horse car, so should the electric truck, one of the most useful inventions of the 20th century, succeed the slow going ox and the expensive horse.

Mr. Baker's paper proved of general interest and a number of questions were asked as to the comparative cost of motor trucks and horse service, for installation and maintenance of plant. Mr. McArthur related his experience.

A paper was also read by William Hayes, of Auburn, Me., on Additional Top Strippers on Revolving Flat Cards.

Thursday morning's session opened at 10.30 A. M. with the reading of a paper by Arthur D. Little on The Cotton Fiber Substance and Its Properties, as follows:

The Cotton Fiber Substance and Its Properties.

ARTHUR D. LITTLE, Boston, Mass.

Although the cotton fiber appears white in the mass, the cellulose of which it is composed is transparent, the apparent whiteness of the fiber being due to multiple reflection from many surfaces. A film of cellulose is quite as transparent as good glass. Not only is cellulose extraordinarily tough but it is extremely strong. Ordway has shown that a single cotton fiber will sustain a weight of 10 grams, a result which proves that an equal section of good cellulose is as strong as good steel. Few men are strong enough to tear a thin film of cellulose once folded. Moisture increases both the suppleness and strength of cellulose, a fact which cotton manufacturers recognize in their attempts to maintain a moist atmosphere within their mills. The experiments of O'Neil seem to indicate that carefully bleached cellulose is somewhat stronger than the more impure form, and this of course is a point of first importance to all finishers of cotton goods.

Despite the great bulk of cotton, the specific gravity of cellulose itself, of which purified cotton may be taken as the type, is 1.5. Dry cellulose is a non-conductor of electricity, else cotton yarn could not be used for braiding wire or paper employed for wrapping cables.

Cellulose is very resistant to most forms of chemical attack. Cellulose structures in the form of mummy cloths, ancient papers and papyri have survived the vicissitudes of thousands of years. It is one of the most permanent of natural products although fortunately, as we shall see, very susceptible to attack on certain lines.

This material, so permanent, tough, strong and yet so light, is an ideal substance for constructive purposes, and as such has been utilized by Nature in full measure. It is not too much to say that

it is by far the most important material of construction known to man. As the tough, strong, elastic, water-permeable wall of the plant cell it constitutes the structural limit of the entire vegetable kingdom, and the prosperity and habit of life of whole communities are determined by the form in which these cellulose structures are supplied to them by Nature. Life is one thing in a community surrounded by tall timber, it is another thing where the prosperity of the community is bound up in cotton, something different still where bamboo replaces timber or where flax is grown instead of cotton. I need not, to prove my thesis, burden you with statistics of the lumber industry, the cotton crop, the acreage sown to flax, the capital in linen mills, the output of cordage, smokeless powder, celluloid and countless other things. It is enough to say that every one of these activities is based on cellulose and determined in its direction by the properties of cellulose. This being true, it is not surprising that every addition to our knowledge of cellulose has proved a starting point for new great industries.

Cellulose is formed by the plant from water and the carbonic acid gas present in the atmosphere. Its formation as such makes no demands upon the soil. Under the influence of its green coloring matter and of sunlight the plant as it is now believed converts the carbonic acid of the air to formaldehyde, which by a process known as condensation, is thereafter changed to certain sugars which pass into the sap. These sugars are later fabricated into cellulose, which is laid down by the living protoplasm of the plant cell as a limiting and confining wall. The shape of this wall is determined by many factors, as by the pressure of other cells upon it. In exceptional cases, as in the seed hairs of the cotton plant, the wall may take the form of a slender isolated tube. More commonly this tube has been compressed by the crowding of its neighbors into a polygonal section, as in jute, manila and sisal.

Cellulose is soluble in the solution of copper hydrate in ammonia known as Schweitzer's reagent. This fact has been utilized in the manufacture of the well-known Willesden fabrics in which cotton cloth is passed through the solution and afterwards dried. The partial solution of the cellulose and subsequent drying coats the fabric with a firmly adherent varnish which greatly increases its power of resisting water. Some of the earlier filaments for incandescent lamps were prepared by Crookes from cellulose sheets and rods formed from cotton made plastic by this reagent. At the present time several successful processes for the manufacture of artificial silk depend upon this property of cellulose.

Cellulose, in the form of cotton fiber or paper, is also rendered plastic and may even dissolve to a syrupy solution in contact with a strong solution of zinc chloride. Upon this fact several important industrial processes are based. Carbon filaments for incandescent lamps are made by treating cotton with zinc chloride, squirting the mixture through a fine orifice into a setting liquid like alcohol, and then carbonizing the filaments by heat. Vulcanized fiber, a product largely utilized in the electrical industries and other arts, is prepared by passing cotton paper through zinc chloride solution to superficially soften the fibers, after which the paper is wound up to any desired thickness on a drum and finally washed to remove the chemical. The product is remarkably tough and strong and dulls cutting tools even more rapidly than steel.

Strong sulphuric acid similarly gelatinizes cellulose and may even dissolve it with formation of invert sugars. The superficial action is made use of in the process of making parchment papers in which unsized paper composed of cotton fibers is passed through the acid and afterwards washed. The product has many of the properties of animal membrane. It is impervious to fats and consequently largely used for wrapping butter.

Under the action of strong alkalies cellulose is partially gelatinized and undergoes a considerable shrinkage. It acquires at the same time greatly increased strength and takes dyes much more deeply. We are indebted for these facts to Mercer. It was later found that if the cotton or other cellulose fiber were strongly stretched while under the action of the alkali it acquired a remarkable silky luster. The development of luster is more marked with long staple cotton like Sea Island or Egyptian and is due to the heavy strain put upon the fiber in the semi-plastic condition induced by the alkali. The broad, twisted, collapsed fiber tube is thus drawn out into a smooth rod with relatively thicker walls which closely approximates the microscopic character of silk. As a result of this discovery the process of mercerizing has nearly revolutionized the manufacture of fine cotton textiles.

Weak acids slowly attack cellulose, converting it to a very friable product known as hydrocellulose. Upon this fact depends the well-known process of carbonizing wool and shoddy to remove burrs or cotton fibers. The wool is saturated with weak mineral acid or an acid salt like chloride of alumina and then dried, with the result that any vegetable fiber is rendered so brittle as to readily dust out.

Oxidizing agents as solutions of bleaching powder, permanganate of potash and so on, are without action upon cellulose in dilute solution at temperatures below 100° Fahrenheit when properly controlled. If the temperature is raised or the solution allowed to become concentrated, the cellulose is attacked with formation of the white and brittle oxycellulose. This material has a remarkable power of fixing certain dyes and this fact is utilized in bleaching to increase the dyeing power of cotton yarns by the superficial formation of oxycellulose. Oxycellulose has a remarkable and unexplained power of attracting and fixing certain salts from extremely dilute solutions. Fibers superficially converted to oxycellulose will remove vanadium from solutions containing only one part of the element in one trillion. Oxycellulose has also a powerful attraction for basic dyes though not for those of acid character.

In its general chemical relationships cellulose belongs to the great group of substances of vegetable origin known as the carbohydrates. It is

thus directly related to the starches and the sugars. From these materials alcohols are readily formed as they may easily be formed from cellulose itself. Indeed in many of its relationships cellulose directly suggests the alcohols and like them is readily converted into ethers through reaction with certain acids.

For many constructive purposes the highly inflammable or even explosive quality of the cellulose nitrates constitutes a serious drawback, as for example in the production of biograph films for moving pictures. As the result of long research a new series of cellulose compounds has been developed in which acetic acid replaces the strongly oxidizing nitric acid. These compounds are known as cellulose acetates and are beginning to replace the objectionable nitrates. They have the great advantage of being no more inflammable than paper and are soluble in chloroform, acetone and other solvents according to the method of their preparation. The nitrates dissolve in acetone, amyl acetate and a mixture of alcohol and ether, the relation to particular solvents being determined by the degree of nitration.

Both nitrates and acetates of cellulose are prepared by processes which conserve all the structural characteristics of the original fibrous raw material, so that when prepared from cotton for example, there is no change in the appearance of the fiber, although its chemical properties have been so profoundly altered and its weight greatly increased.

The most interesting compound of cellulose brought forward within recent years is the product discovered by Cross and Bevan and known as viscose. It derives its particular interest from the new evidence which it affords of the close relationship between cellulose and the alcohols. If ordinary alcohol and caustic soda are exposed to the vapor of bisulphide of carbon a compound is formed which is known as iodium xanthate. If cellulose in the form of cotton fiber is substituted for the alcohol a directly analogous compound results. This compound is soluble in water, it is plastic and may be fashioned into any desired shape. Upon heating, however, the compound decomposes, forming cellulose again, associated with certain salts of sodium. These are readily washed out, leaving the pure cellulose in whatever form was impressed upon the plastic xanthate.

The possible commercial applications of this discovery cover an extraordinarily wide range and a considerable number of them have already become the basis of important industries. Among these may be mentioned the manufacture of artificial silk and artificial horsehair, the production of membraneous caps for sealing bottles, artificial leather and a great variety of moulded articles. Many other applications have been proposed and are still the subject of experiment. They cover such a wide range as the sizing of paper, paper coating, cloth finishing, calico printing, the manufacture of smokeless powder, the production of special paints, non-inflammable substitutes for celluloid, and so on in variety too great for enumeration.

Despite the fact that the chemistry of cellulose, the substance of the cotton fiber, remains one of the most difficult and elusive branches of the science, enough has been suggested to indicate something of the vast extent of the field which it involves and the importance of research in that field to every manufacturer of cotton fabrics. Let me say again that every advance, however slight, in our knowledge of the chemistry of cellulose, has supplied the foundation of some great industry.

Following this paper Harvie Jordan of Atlanta, Ga., presented a most interesting paper on the Better Baling of American Cotton.

Better Baling and Handling American Cotton.

HARVIE JORDAN, Atlanta, Ga.

We have practically the same bale and the same method of handling today which was in force fifty years ago. The unpardonable waste, absolute neglect and unnecessary expense and losses to which the American cotton crop is subjected each year by unbusinesslike management, is almost a crime and is a grave reflection upon the intelligence and business sagacity of the whole American people.

There is no single section of the country upon which the blame for this very unwholesome condition of affairs can be fastened. The wide and almost complete prevalence of custom, or public ginning, has placed the average grower of cotton in a helpless condition to bring about the reforms needed. The system built up by the general cotton handling trade of the South, with its investment of millions of dollars in large compresses, has always fought every effort of reform in baling through the medium of local gin house compression, while the spinners have been content to mildly protest and pass resolutions hoping for a reformation which has never materialized. It is not my object to criticise the apparent lack of interest on the part of the New England spinners in helping to introduce reforms in the baling and handling of cotton.

I do wish to say, however, that our spinners have a responsibility resting upon them in connection with this important matter which they cannot escape and which they should at once begin to fully realize.

The gap of estrangement, or dealings between the cotton growers and the spinners is too wide apart.

The interest of the one is vital to that of the other, and should be so recognized and understood.

The mission of the grower is to produce raw cotton, and that of the spinners and manufacturers to convert the raw product into the finished fabric.

These two interests should combine in forcing those middle interests which occupy the various positions of ginning, baling, handling and delivering the crop from the farmer to the spinner, to introduce such methods as will meet the demands of modern requirements at the hands of twentieth century civilization.

No satisfactory reform in the baling and handling of cotton can be worked out, except through the compression of our cotton at the gin plant, just as is done in all the cotton producing countries of the world, except in the South.

The inventive genius of our people has now made it easily possible, and thoroughly practicable, to compress our cotton at the local gin plant, turning out a neat 500 pound square bale of thirty pounds' density to the cubic foot.

The practical illustration of this new bale is now on exhibition in this building, the product of The Farmers' Gin Compress and Cotton Company of Memphis, Tenn., and an investigation of this bale is very earnestly desired by every spinner and manufacturer present at this convention.

This new bale will meet all the modern requirements of the most economic handling and marketing of the crop. There will be no need of recompression at the large compress plants, with its attendant high freight rates, heavy tare and excessive waste in sampling.

Freight cars can be loaded to their full carrying capacity at the initial point and billed through to final destination without loss of weeks and months of time, taken up in transit as at the present.

One car can be made to do the work of six freight cars under the present system, and the transportation charges thereby largely reduced.

The new bale, carrying a uniform weight of bagging and ties not to exceed fourteen pounds, can be sold to the spinners on its actual net weight basis, and the old system of tare eliminated.

With gin compression in general use the entire cotton crop can be moved with 15,000 freight cars instead of the 45,000 now required.

The new bale will be covered with a lightly woven burlap and the objectionable features and losses attendant upon the use of jute bagging entirely eliminated.

The new style bale can be sampled in the process of compression, the grade and number marked on the end of the bale, while the bale of cotton will go to the spinner without the bagging being cut and torn by constant sampling and resampling as at the present time. I take the position that no bale of cotton should be cut into for the purposes of sampling except by the spinner to whom the bale is finally delivered for consumption.

It is estimated in the Fall River district alone that the annual losses from stealage and waste with the present method of handling cotton amounts to the enormous sum of $400,000.

This estimate would imply an annual loss from waste and stealage on the entire crop of from twelve to thirteen million dollars, and this is only one of the many items of high and unnecessary fixed charges from which the growers and spinners are forced alike to suffer.

The freight rate on cotton is from three to five times as high as the rates charged by the railroads on other raw commodities.

This is due to the bad manner of handling and failure to deliver to the transportation companies sufficient tonnage at the initial point to secure an economic carload rate.

The new style bale, not having to go through the process of recompression and patching, characteristic of the old style bale, will carry its identity undisturbed from the grower, who had it ginned and baled, to the spinner who finally received it.

The International Conference between growers and spinners held at Atlanta, Ga., in October, 1907, fully emphasized the necessity for better methods in the handling, ginning and baling of American cotton.

The spinners of the world fully realize the necessity for gin compression as the opening wedge to bring about the reforms needed in the cotton trade.

If gin compression is to become a speedily accomplished fact, followed by the better and more economic handling of cotton, the spinners must give to the adoption of the new style bale their cooperation and support.

They must meet the growers half way in their present efforts to overcome many of the local obstacles in the South, and give to the movement that material aid which will make success swift and sure.

The foreign spinners, I regret to say, are today taking more active interest in encouraging the adoption and promotion of gin compression and better methods of handling cotton in the South than our new spinners in America.

They realize the economic advantages in the purchase of the new bale.

On shipments of this new gin compressed bale to Manchester, Eng., and to Providence, R. I., from a point in Louisiana, we received a rate of 51 cents per hundred to Manchester, and 60 cents per hundred to Providence, making a difference of 45 cents per bale cheaper to England than to Providence, although Manchester was several thousand miles further.

This was entirely due to the reduced rates voluntarily given by the Ocean steamship lines in favor of the new bale, which our railroads have not yet recognized, but which they will later on.

Under these conditions the foreign spinners can get their cotton delivered to them much cheaper than the New England spinners, and fully appreciating the many other advantages of the new bale over the old style, they are actively supporting this reform in baling and handling.

The new bale will be handled by as responsible cotton firms as there are to be found in the cotton trade, which will give to the new system all of the financial strength and confidence required of the consumer from the seller.

The New England cotton broker may continue to ply his vocation so long as the cotton trade has need for his services, without fear or prejudice of the new system. There are thousands of unnecessary leeches upon the cotton trade, however, whose services may well be dispensed with, and whose time and abilities can find employment elsewhere.

We are teaching our people better methods of culture of the crop, better care in selection of

seed, more care in gathering and housing from the weather.

I realize fully that your experience in the pioneer development of gin compression through the medium of round bale presses some years ago was a costly one and altogether unsatisfactory to many of you.

We are taking advantage of the mistakes made at that time and are now in position to carve success out of the new and better methods of gin compression. We want the spinners as partners with us in this reform, and feel satisfied that a combination of growers and spinners in the better handling and baling of cotton will speedily bring about that relief to the present bad methods of the cotton trade which you so earnestly desire.

We must discard the primitive and wasteful system for a modern and up to date economic system. We must apply the same rule to the future handling of cotton that you apply to the modernly equipped mill.

We are trying to do all of those things which add to the value and usefulness of the great staple crop of this country, which gives employment and clothing to millions of the civilized nations of the world.

In working out these problems of the better handling, baling and transporting the American cotton crop from the farm to the manufacturer, we ask that full support and cooperation from the American spinners which it is so important they should give to a movement in which they are necessarily as vitally interested as the growers.

Let the question of price be regulated by the legitimate laws of supply and demand rather than by those fluctuations which are disastrous alike to both growers and spinners.

At the conclusion of Mr. Jordan's remarks Mr. J. R. MacColl discussed the paper to some extent and took occasion to remark that at last there was something tangible in sight which offered a practical solution of the baling question and he hoped that the cotton spinners would cooperate in giving preference to cotton properly baled, believing that they could afford to pay perhaps $1 a bale more for cotton received in good condition.

A sample bale such as advocated by Mr. Jordan for a gin compress plant was exhibited.

Then followed

The Report of the Commtitee on Standard Specifications for Staple Gray Goods.

As a preface to what follows, the committee respectfully refers you to its first report, presented at the Saratoga meeting last September. Since then, the work of the committee has not lagged, but, through personal investigation by its members, through data supplied the committee by members and others, by inquiries sent to those interested in the cotton goods trade, and by a study of publications, the committee has conscientiously endeavored to reach conclusions that will at the same time be practical, scientific, and fair.

By vote of the Association last autumn, the work of the committee was enlarged to include a standard form of contract for cotton goods, in addition to its work on specifications. In order that the two may not be confused, this report will be divided into three parts:

1. Specifications.
2. Contract.
3. General Conclusions.

SPECIFICATIONS.

Instead of defining our work as that of providing standard specifications for staple gray goods, it might, perhaps, better be described as that of defining allowable limits of variation from nominal specifications. Subsequent to making its first report, your committee decided definitely to define limits of variation only on the three points, or specifications, of width, count and weight,—the other points mentioned involving problems too intricate to solve in this manner.

Your committee offers the following set of variation limits from nominal specifications for staple gray goods, in the hope that they will be considered favorably by you.

ALLOWABLE VARIATIONS FROM SPECIFICATIONS.

WIDTH.

The width shall not vary anywhere by more than 3/8 of an inch below the stipulated width, nor more than 5/8 of an inch above. The width shall not be uniformly less than the stipulated width, but must, at least in some places in each piece, be equal to, or greater than, the stipulated width. Goods shall be measured at right angles to the selvage when laid open on a flat, horizontal surface and smoothed out by hand, but not stretched.

WARP COUNT.

Except within four inches of the selvage, the number of warp threads per inch shall not vary anywhere by more than one thread per inch below the stipulated count, nor by more than two threads above. The number of threads per inch shall not run below the stipulated count throughout the piece, but must, at least in some places in each piece, be equal to, or more than, the stipulated count.

FILLING COUNT.

The number of threads in the filling, or weft, shall not vary anywhere by more than three threads per inch below the stipulated count, nor by more than four above. In case of sateens, however, when the count of filling exceeds the count of the warp, the allowance for variation above specified shall be increased by the same percentage that the filling count exceeds that of the warp count. In any case the filling count per inch shall not run below the stipulated count

throughout the piece, but must, at least in some places in each piece, equal, or be more than, the stipulated count.

WEIGHT.

Goods shall not vary from the stipulated weight on either side by more than 4 per cent. in any one piece, or 2 per cent. in the average of any bale or roll. In case of controversy regarding the weight of goods, decision shall be based on goods which have been exposed for twenty-four hours to a temperature of 70° Fahrenheit, and a humidity of 70 per cent.

The New York Conditioning Works, 138 Spring St., New York, have a room specially equipped for weighing goods under the conditions stated.

The word piece, as used above, refers to a length of about 50 yards.

Although we believe that the above will be clear, some explanation may be desirable on a few of the points involved.

In the first place, we should state that the variation limits specified are not based on theory, but fact. They have been made up from data regarding a large quantity of goods and a large number of widely varying constructions of staple gray goods, which, by common consent of manufacturer and consumer, have been considered as good delivery, and only in a very small degree are they based on theoretical ideas as to what the manufacturer should make or the buyer receive. We wish to particularly emphasize this point. The variations we recommend to the trade for adoption are only those which are actually being accepted by buyer and seller today, as proper ones covering the great majority of transactions. The soundest argument we can produce, in support of our recommendations, and in reply to criticisms that the allowable variations are too great, is in the measurement of the critic's own goods. If he will make a conscientious and exhaustive inquiry as to whether such staple gray goods as he is making or buying come within these variations, we believe that he will find in general that, in so far as they conform to these limitations, they would be accepted as satisfactory delivery in width, count and weight, and, in so far as they do not so conform, that they would not be satisfactory delivery. "The proof of the pudding is in the eating" is quite applicable to this case, and we might also add that "Those who live in glass houses must not throw stones."

A GROUP OF COTTON MANUFACTURERS AT THE CONVENTION.

In connection with our recommendation on width, we find that, in general, it agrees with common practice and with trade rules of other countries, wherever we have found any such. Data received by the committee indicate that more than 95 per cent. of all goods made in this country are 40 inches wide, and under, and, therefore, that variations should be defined that will be most applicable and correct for goods 40 inches in width, and under, and if, in any special cases, they are found impracticable for wider goods, such cases would naturally be considered as special, and not subject to the rules on this point. Moreover, for the great bulk of goods 40 inches wide, and under, the actual fractional limitations adopted have been found much nearer the truth

than any percentage limitations, and, at the same time, more practical for use by manufacturer and consumer.

In connection with count, we have found that, in the case of most of the staple constructions, definite variations are much nearer the truth than percentage limits, and would be much more satisfactory to use in practice. This seems to be true of goods of both high count and low count, made of fine or coarse yarn, with the exception of sateens, as provided for under filling count.

Please note particularly, in connection with defining variations for width and count, that, at least in some places, each piece must measure and count equal to, or more than, that stipulated. In our opinion, this clause, coupled with the variations allowed, assures the buyer against any deliberate or undue attempt, on the part of the manufacturer, to deliver something less than that practically required by the nominal specifications. Under the limitations imposed, it would be a physical possibility to make goods of inferior and unsatisfactory character, but to do so would cost considerably more than to make them right.

The upper limits for width and count have been made more than the lower limits to avoid penalizing full measure. A manufacturer who is disposed to give more than required should receive due credit for it, and certainly should not be penalized.

Allowable variations in weight have been expressed in percentages, which is very clearly the correct basis, in preference to definite fractional differences of yards per pound, or ounces per yard. As far as can be determined, foreign trade customs correspond closely to our weight recommendation. Moreover, the allowable variation above the nominal weight has been defined the same as that below to avoid possible confusion of terms, and because there are, in general, from the buyer's point of view, as many cases where overweight is objectionable as there are cases where under-weight is objectionable. The limits specified will seem large to many buyers, who have been accustomed to buying goods of medium weight, and who have applied weight tests to the average weight of a whole shipment. Your committee investigated this point, perhaps, more completely than that of any others,—having received weight measurements from members of the Association, and others, on a total of over 3,000 pieces of goods, made of yarn varying from No. 6 to No. 128. Your committee takes this opportunity of thanking the members of the Association, and others, who have so kindly and generously assisted the committee in its work on this point by extensive weight measurements on their own goods.

The weight variations referred to are intended to cover only manufacturing variations, and not those that occur from atmospheric changes. Differences in weight due to ordinary changes in the humidity of the atmosphere are very large, and may be estimated at a total of 6 per cent. between minimum and maximum weights. It would clearly be impracticable, under present conditions, to define variation limits due to that cause. We have, therefore, called attention to the fact that, for the purposes covered by our report on weight, variation limits apply to goods weighed under average cloth room conditions, which, we believe, agree closely with the average atmospheric conditions of consumers' warehouses and factories, and which we estimate would approximate a temperature of 70° Fahrenheit, and a humidity of 70 per cent.

CONTRACT.

Your committee, in considering a standard form of contract for cotton goods, has worked in conjunction with a committee appointed by the American Cotton Manufacturers' Association about a year ago, and which has, in a very generous and broadminded way, cooperated with us. It has been thought best, for the time being, to limit the scope of our work on this point to a form of contract sales note, to cover the ordinary transactions in staple gray goods.

Attached to this report, please find our proposed form of contract sales note, adapted for the use of brokers, and equally available, with the change of a word or two, for use by commission merchants or by manufacturers.

This has been made up with two fundamental principles in mind, namely:

1. To provide in the sales note an opportunity for the insertion of all details peculiar and essential to each transaction, in such a way as to leave no doubt regarding the meaning of each detail, and, at the same time, continue every desirable present-day custom under which transactions are made.

2. To provide briefly, on the face of the sales note, a statement of common law as applied to cotton goods contracts, conforming to the best and most general practice of today, and to harmonize whatever differences of opinion may exist in regard to such details.

The legal work on the proposed form has been done by the firm of Fish, Richardson, Herrick & Neave, under the personal direction of Frederick P. Fish, Esq.

There are three general causes of trouble and litigation in the present methods employed in buying and selling cotton goods, namely:

1. A failure to clearly express and define the practical features of the agreement.

2. A failure to make clear and binding the legal features of the agreement.

3. A great lack of uniformity in the methods and sales note forms employed.

In connection with the first point, our proposed form has been made up with the greatest possible care, with the aim of providing a form which, when filled in, would necessarily result in a clear statement of practical conditions intended and agreed to by both parties to the contract. In the case of staple gray goods, the application of our work on allowable variations from width, count, and weight to a sales note, as proposed in our form, will still further clarify and define the practical terms involved.

The same principle has been followed in making up what legal conditions are included in the proposed sales note. In general, they are simply a concise statement of common law, supplemented.

however, by a few items in which uniformity of understanding and practice would be desirable. These legal conditions, when agreed to by buyer and seller, would become binding, regardless of the laws of the state in which the seller or buyer resided.

In general, the sales note contemplates merely a continuance of the best and most customary practice of today. However, at present every seller or broker has his own sales note form, and though each has its advantages, there is no doubt that benefit would result to the trade at large if a good form, that would bear the test of law and use, could be provided and used by all.

Herewith, as in connection with our work on specifications, we wish to extend our hearty thanks to those members of the trade, both inside and outside of our Association, and that of the American Cotton Manufacturers' Association, who have generously offered us their assistance. We also thank Walter S. Newhouse, Esq., of the New York bar, who has gratuitously and kindly offered suggestions.

GENERAL CONCLUSIONS.

In thus presenting the result of its labors, your committee confidently believes that benefit will result to the cotton goods trade of the country at large by the use of these standards. The need for improvement on present methods has often been expressed, but the introduction of such improvements may meet with opposition, and, in fact, in many cases, will be opposed by the very ones whom such standards should benefit. We believe an approval of our work by this Association, especially when followed by approval of similar recommendations by the American Cotton Manufacturers' Association, will result in providing standards for use in cases of controversy, whether in direct settlement between the parties involved, or through arbitration, or the courts.

Your committee hopes and believes its report will be accepted and its recommendations adopted both by this Association and the American Cotton Manufacturers' Association. We believe that, to foster the introduction of these standards, it would be well to continue the committee; and further, that when changes may be found necessary in any details, and when so recommended by the committee, the Board of Government be given authority to act for the Association on such changes.

Respectfully submitted,

Albert F. Bemis, Chairman,
President, Bemis Bro. Bag Co.

Frederick A. Flather, Secretary,
Treasurer, Boott Mills.

Daniel M. Bates,
Ass't Supt., Jos. Bancroft & Sons Co.

S. Parker Bremer,
Of Parker, Wilder & Co.

John Eccles,
Agent, Ponemah Mill.

Alfred M. Goodale,
Of A. M. Goodale & Co.

Edwin Farnham Greene,
Treasurer, Pacific Mills.

George H. Hills,
Treasurer, Davol Mills.

Frederick B. Macy,
Treasurer, Soule Mills.

James R. MacColl,
Treasurer, Lorraine Mfg. Co.

Lewis W. Parker,
Treasurer, Olympia Cotton Mills.

CONTRACT SALES NOTE.

Number .....Place .....Date .....
Sold for Account of .....
To .....

Quantity: .... yards (variation not to exceed two per cent. allowed); .... pieces of .... yards each; .... bales of .... yards each. In addition, buyer to take .... per cent. Seconds and .... per cent. Tailings at stated contract price if contract is not renewed.

Quality .....

Time of Delivery: .... from date hereof; .... during each week, commencing week ending ....; .... during each month, beginning in the month of .... on ..... (Delivery within two days before or after times specified above is allowed.)

Count per Inch: Warp ....; Filling .....

Weight: .... yards to the pound.

Width in Inches: .....

Price: .... cents per yard.

Terms of Payment: Net .... days from date of delivery. Net .... days from date of delivery less .... per cent. for payment within .... days from date of delivery.

Place of Delivery: F.O.B. to carrier at ..... with .... freight allowance. F.O.B.

Shipping Instructions .....

Passing of Title on Delivery: Unless otherwise specified, the title to the goods sold passes to the buyer (subject to the right of stoppage in transitu) when delivered F.O.B. to carrier consigned to buyer and thereafter goods are at buyer's risk. Title to goods consigned to seller's order does not pass until delivery of indorsed bill of lading or of goods. If goods are to be held or if buyer refuses shipping instructions, title will pass on seller separating the goods, and holding them subject to buyer's order, invoice to follow by due course of mail. Sixty days' free storage allowed on goods so held, the same to be at buyer's risk but to be covered by fire insurance effected by seller in reputable companies.

Rejections and Claims: The buyer cannot reject the goods for delay in delivery unless he notifies seller within seven days from receipt of bill of lading, or of invoice if goods are to be held; and he cannot reject the goods for defects in quality or other defaults if he cuts or converts them or unless he notifies seller within thirty days from receipt by him or at finishing works of goods not held or within thirty days after expiration of period of free storage if goods are invoiced and held. Loss of right to reject does not deprive the buyer of his right to claim damages, if any, but no recovery shall be had on any claim not made within one year from receipt of goods or beginning of period of free storage.

Accidents, Etc.: If the production of the seller shall be curtailed during the time above named by labor controversies or unavoidable casualties beyond his control, the deliveries shall be made, and accepted in proportion to the production.

Instalments: When contract calls for delivery in instalments, the buyer cannot cancel the contract for any default in any one or more instalments not amounting to a substantial breach of contract.

This sale note is the entire contract between the buyer and seller.

The allowable variations from specifications adopted by the Associations of Cotton Manufacturers, and printed on the back hereof, are accepted and agreed to as part of this contract, unless otherwise stated herein.

Any alterations in or changes from the printed form of this contract must appear on it in writing.

.....Brokers

To .....

[On back of above form are printed the following:]

Allowable Variations from Contract Specifications.

Width: The width shall not vary anywhere by more than 3/8 of an inch below the stipulated width, nor more than 5/8 of an inch above. The width shall not be uniformly less than the stipulated width, but must, at least in some places in each piece, be equal to, or greater than, the stipulated width. Goods shall be measured at right angles to the selvages when laid open on a flat, horizontal surface and smoothed out by hand, but not stretched.

Warp Count: Except within four inches of the selvage, the number of warp threads per inch shall not vary anywhere by more than one thread per inch below the stipulated count, nor by more than two threads per inch above. The number of threads per inch shall not run below the stipulated count throughout the piece, but must, at least in some places in each piece, be equal to, or more than, the stipulated count.

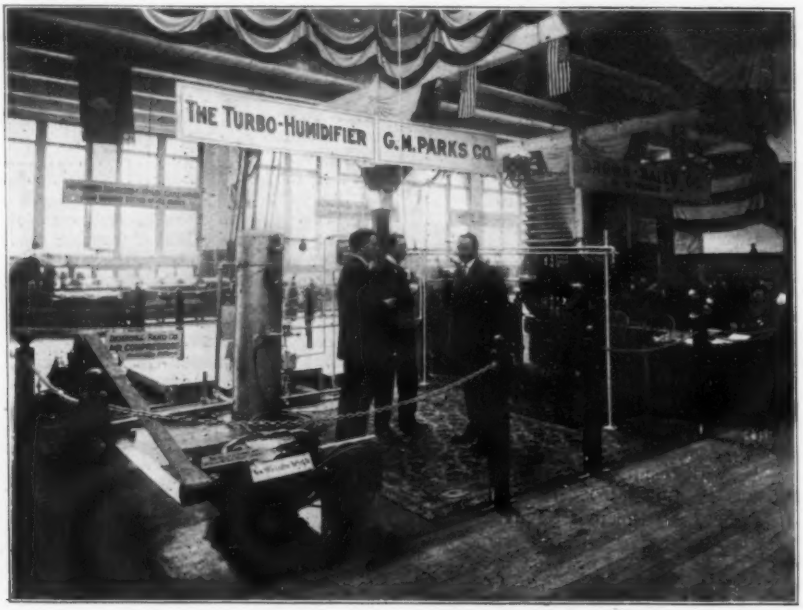
Filling Count: The number of threads in the filling, or weft, shall not vary anywhere by more than three threads per inch below the stipulated count, nor by more than four above. In the case of sateens, however, when the count of filling exceeds the count of the warp, the allowance for variation above specified shall be increased by the same percentage that the filling count exceeds that of the warp count. In any case the filling count per inch shall not run below the stipulated count throughout the piece, but must, at least in some places in each piece, equal, or be more than, the stipulated count.

Weight: Goods shall not vary from the stipulated weight on either side by more than 4 per cent. in any one piece, or 2 per cent. in the average of any bale or roll. In case of controversy regarding the weight of goods, decision shall be based on goods which have been exposed for twenty-four hours to a temperature of 70° F. and a humidity of 70 per cent.

The New York Conditioning Works, 138 Spring St., New York, have a room specially equipped for weighing goods under the conditions stated.

The word piece, as used above, refers to a length of about 50 yards.

(Continued on page 304)

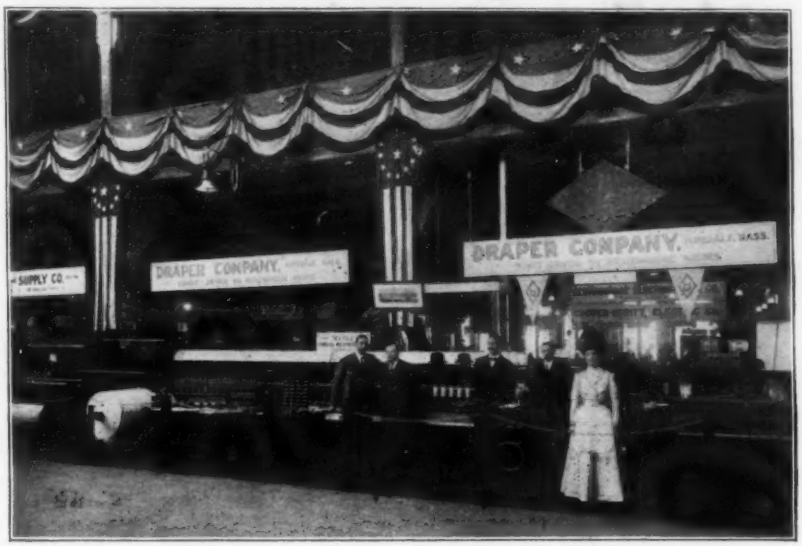


THE EXHIBIT OF THE G. M. PARKS CO.

The Textile Machinery Exhibition.

From the standpoint of general interest the exhibition of textile machinery and mill supplies proved an equal attraction with the convention in bringing cotton manufacturers, agents, superintendents and mill men generally to the Mechanics Building, Boston, during the week of April 26th and May 1st. Even those who were in close touch with the progress of affairs were agreeably surprised with the extensive and comprehensive show. More than seventy separate exhibits were made, many of them consisting of machinery in operation and with few exceptions, all were of interest to mill men from the point of novelty or improved features. The hall was attractively decorated with hangings of bunting and flags arranged in harmonious color scheme. On the days of the convention an orchestra furnished music in the afternoon and evening and at frequent periods during the day a moving picture show representing scenes in connection with cotton growing, marketing and manufacturing provided entertainment to many.

The executive committee of the Textile Exhibitors' Committee, composed of F. H. Bishop of the Universal Winding Co., E. F. Hathaway of the American Warp Drawing Machine Co., M. H. Merrill of the Allis-Chalmers Co., and D. A. Corey of S. F. Bowser & Co., must have felt gratified at the general recognition of the satisfactory result of their arduous labors and unflagging enthusiasm. During the past few months they have been untiring in their efforts to make the exhibition a success. They wisely entrusted the general management to Chester I. Campbell, who has successfully conducted many other exhibitions, particularly the automobile show and is familiar with the many details of such an exhibition. He also is deserving of the highest praise.



THE EXHIBIT OF THE DRAPER COMPANY.

An admission fee of 25 cents was charged to the general public and more than a thousand paid admissions were taken. The liberal distribution of complimentary tickets by exhibitors and members of the association and the large attendance of the mem-

bers of the association comfortably filled the hall after the first two days.

It was the generally expressed opinion that few if any previous conventions have been attended by so many prominent men and so much serious interest shown on all sides. The hope expressed by the Governor in his address of welcome that the exhibition feature might become a frequent accompaniment to the Conventions, was echoed by a majority of the visitors.

THE EXHIBIT OF THE UNIVERSAL WINDING CO

Many of the exhibitors expressed themselves as greatly pleased with the results. Parties with whom they had been in correspondence had called and taken the opportunity of personally examining the machines and products. Many new "prospects" were discovered which would lead to business later, and several of those who were most skeptical as to the advantage of exhibiting were among the most enthusiastic at the end of the week.

The general arrangement of the exhibition hall has been already illustrated by diagram. The illustrations which we publish give a very good idea of the general appearance of the exhibition hall and of many of the separate exhibits.

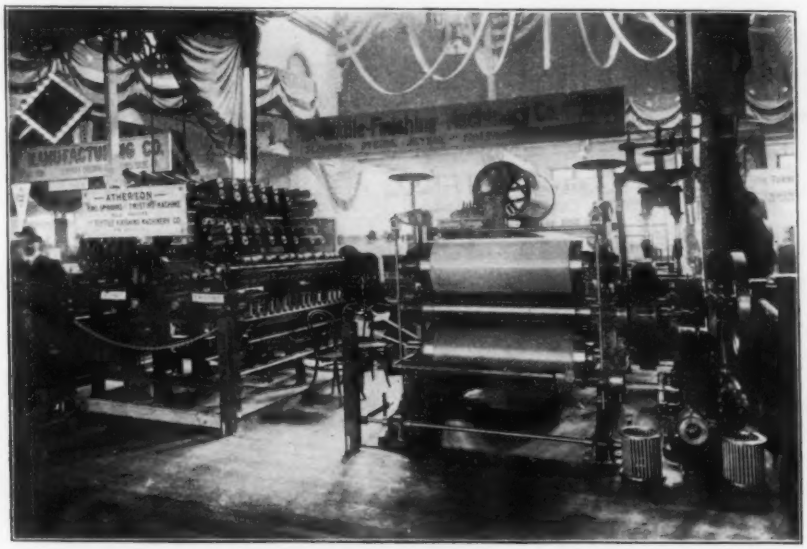
The Whitin Machine Works, Whitinsville, Mass., makes a display to show the advantages of semi-combing. Their display includes a sliver lap machine, a ribbon lap machine, a comber which is semi-combing and reclaiming cotton from waste, running on laps composed of 50 per cent. card strippings and 50 per cent. combing noils, out of which the comber is reclaiming 75 per cent. good cotton worth about 12 cents a pound and which formerly sold at about five cents a pound; also a second comber running Sea Island, Egyptian, and hosiery cotton. This second comber is working on two laps of 1-inch hosiery cotton, 3 laps of 1 3/8-inch Egyptian cotton, and 3 laps of 1 3/4-inch Sea Island cotton at the same time with the same settings. The builders claim this is impossible for other machines.

Draper Company's exhibit occupies spaces 30 and 31 on the main aisle of the Exhibition Hall. Perhaps the most interesting part of their display is a Northrop loom weaving a fine lawn with 80s warp and 120s filling. The automatic yarn tester for testing single threads and automatically recording on a chart the breaking strength in ounces is a

triumph of inventive genius appreciated by visitors. In addition to these the Draper Company shows an improved spooler, a fine warper, a coarse warper, ball warper, a line of Dutcher temples, bobbins, spinning rings and spindles.

The Cell Drier Machine Co., Taunton, Mass., have set up an improved horizontal repeat order. Another order in hand is from the Farr Alpaca Co. for a fourth Cell Drier.

The S. F. Bowser Co., Inc., Fort Wayne, Ind., oil storage and destributing systems, have an interesting exhibit of their products. The ones of most interest to the textile trade are a non-overflow oil can filler, stationary and portable fire proof oil tanks.



THE EXHIBIT OF THE TEXTILE FINISHING MACHINERY CO.

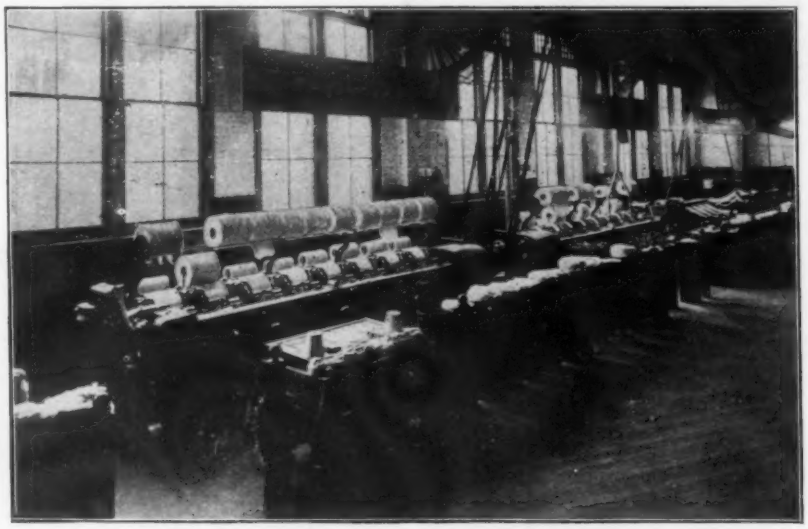
type of cell drier in their space at the foot of the stairs leading to the Convention Hall. This is an imposing machine with a capacity of 75,000 yards per day on some classes of goods. A number of slasher cells are shown in their space. These cells are placed under the cylinders of the slasher, the yarn passing over and under them on the same principle as cloth passes through the cell drier. The presence of cells is estimated to add 25 per cent. to the production of a slasher.

It is a matter of interest to learn that the Cell Drier which attracted so much attention was sold to the Waltham Bleachery, Waltham, Mass. It is a duplicate order. The set of slasher cells was sold to the Fulton Bag and Cotton Mills of Atlanta, also a

G. M. Parks Co., Fitchburg, Mass., have installed and are operating a model Turbo-Humidifier plant in space 26 which emphasizes the simplicity of this system of humidifying. The equipment consists of a motor-driven air compressor, receiving tank, water tank, and two turbo-humidifier heads. The freedom from intricate mechanism and inaccessible parts, also the ease of operation and control, are brought out clearly.

Macrodi Fiber Co., Woonsocket, R. I., manufacturers of fiber head spools well known in the trade, have an extensive exhibit of their products. They state that the fiber head will not split or crack like wood nor rough on inside. In addition the fiber is more durable and lighter.

The Universal Winding Co., Boston, showed six styles of their machines and a fine line of samples covering different kinds of winding done on Universal machines. Included in their exhibit are two new machines for winding filling on shuttle bobbins. These are operating on cotton and silk yarns, illustrating the range of work which can be handled. In addition a machine is operating on cone winding and another machine on tube winding. A large machine for winding cordage is an interesting feature, also a machine winding twine in 8-inch packages.



THE EXHIBIT OF THE WHITIN MACHINE WORKS.

The C. J. Root Co., Bristol, Conn., had on exhibition a line of counters for an almost infinite variety of purposes. This device is used in textile mills for counting the revolutions of engines, pumps, and waterwheels, also on winding, folding, and printing machines, and on looms. As one of the latest devices used in the textile industry this display receives its full share of attention.

The American Warp Drawing Machine Co., Boston, has set up a tubing machine and three warp drawing machines in spaces 22, 23 and 24. The tubing machine is for carpet mills and is sold to McCleary, Wallin & Crouse, Amsterdam, N. Y. The first warp drawing machine is on five harness work with Draper stop motion and will be shipped to Richard Borden Mfg. Co., Fall River. The second is for six harnesses, steel heddles, and has been sold to Fulton Bag and Cotton Mills. The third is the plain two harness machine and will be installed in the Stafford Mills, Fall River.

The Holtzer-Cabot Electric Co., Brookline, Mass., have a diversified display of electric apparatus, including low voltage dynamo for stop motions, motors for individual drives, telephone and bell systems, watchman's clocks and sundry lines. This is one of the most complete lines in the hall.

The Carrier Air Conditioning Co. of America, New York, have installed and are operating in their space a specimen apparatus for humidifying, heating, cooling and ventilating an entire mill. The apparatus shown is a little smaller than would be used under actual conditions in the mill, and of course is not connected as under practical circumstances; but an excellent idea of how

they accomplish with one apparatus, automatically controlled, the operations mentioned above, is given.

equipped it with shafts, belts, ropes and pulleys for practically all sorts of drives. The maze of belts and ropes running in all direc-

THE EXHIBIT OF THE CELL DRIER MACHINE CO.

THE EXHIBIT OF KILBURN, LINCOLN & CO.

Wm. Sellers & Co., Inc., Philadelphia, have constructed a special framework and

tions is a forcible demonstration of their resources for solving transmission problems.

The Textile Machinery Co., Boston, manufacturers of Dunn Flyers for slubbing, intermediate, roving and jack frames flanked their space in three sides with the various styles of flyers and samples of the product made with them, using the national colors to complete the scheme. The general effect is one of the best in the exhibition.

The Crocker-Wheeler Co., Ampere, N. J., has a well located space at the visitor's entrance. The feature of their exhibit is a motor for textile machinery, in operation, showing running torque and starting torque. In addition they show the parts of the motor before assembling, making an instructive display.

The Westinghouse Electric & Mfg. Co. presents a practical exhibit of its electric motors and apparatus especially designed for the operation of textile machinery. The exhibit well illustrates the satisfactory application of the motor drive to this class of work. Spinning frame motors are shown complete and in sections, also a similar display of loom motors. Their type F motor, which is applicable especially to group drives, is exhibited in larger sizes. All of the apparatus is supplied with full equipment of control and protective devices, including spinning frame and loom switches and circuit breakers.

Thomas Leyland & Co., Boston, offered for the interest of visitors a line of Mycock's textile machinery specialties, including regulating cloth stretcher for dyeing machines; regulating cloth stretcher for calender; regulating cloth stretcher for water mangle, with five bars for extra width; chain stitch,

THE EXHIBIT OF THOMAS LEYLAND & CO.

piece-end sewing machine worked by treadle or hand; patent whale-back sewing machine for any width of cloth, having an endless chain and which stamps lot number and trims off edges at the same time. This machine is driven by a motor and is running 1,750 stitches a minute. They show another Mycock specialty in a scutcher fitted with double beater and solid brass scrolls.

The Textile Finishing Machinery Co., Providence, have installed in their space an Atherton ring spinning and twisting frame for flax, hemp, or jute. On their frame it is claimed 25,000 yards can be wound on a bobbin against 4,000 yards on older machines. There also is an advantage in speed. This

frame is doing wet twisting of linen on one side and spinning on the other. They also show copper rolls and cylinders with spiral scoop; electro-deposited copper rolls; standard open front cloth calender; various types of automatic clips for tentering machines and roller bearings for mangles and calenders.

The New York Revolving Portable Elevator Co., The Fairbanks Co., Boston. finding automatic drill loom. This display gives proof of the adaptability of their automatic looms. The arrangement and general equipment of their display is one of the strongest in the hall.

The Chernack Circular Loom Co., Boston, are weaving two sizes of hose on their circular looms. The new principle of this machine and the simplicity of construction creates general interest.

THE EXHIBIT OF THE STAFFORD CO.

agents, are operating one of their portable elevators which is applicable especially to the work of handling materials in various forms and under general conditions in textile mills and storage buildings. The exhibit well illustrates the advantage of portable elevators in handling cotton bales, as the 500 bale advocated by Harvie Jordan is used.

The Stafford Co., Readville, Mass., has a well planned demonstration of the grades of work on which their Ideal Automatic Looms are used. They are operating a 40-inch plain automatic loom on narrow sheeting; a fancy automatic loom with feeler on fancy cotton goods; a ten-quarter automatic loom on broad sheeting, and a three-harness pick

Heine Safety Boiler Works, St. Louis, exhibit a model of their water tube boiler and samples of materials showing quality of material used in their construction. They have a number of good photographs of plants where installations have been made.

The Standard Fiber Co., Somerville, Mass., displays in their space the line of seamless roving cans, trucks, fiber boxes, fiber gears, and washers so well known in the trade. These products are used by the Whitin Machine Works in their exhibition of cotton machinery. The chief advantage of these fiber goods is the absence of seams, rivets and other projections to catch on the material and make waste.

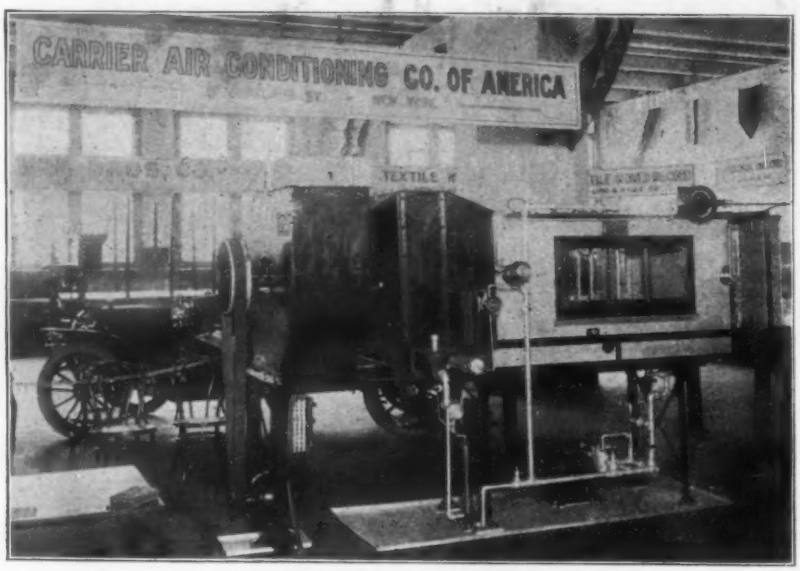
The Bell Humidifier and Rielly Feed Water Heater are exhibited in space 93 by the Griscom-Spencer Co., New York. The installation includes a sample head, electric driven, showing how water is evaporated, in contradistinction from systems which spray it, and a Rielly Feed Water Heater which is accessible by a door without removing steam or feed pipes.

H. W. Butterworth & Sons Co., Philadelphia, manufacturers of bleaching, dyeing, drying and finishing machinery for textile products, feature the Simpson cloth winder in their display. This presents a practical exhibit for this specialized line and is the only machine of this class in the hall.

Cling Surface Co., Buffalo, New York, have a very ingenious device for showing the value of Cling Surface on belts. It consists of a frame with carriage and four dials showing belt tension and brake load, two small belts from the same roll of leather, one of which is running tight but untreated, and the other running slack but treated with Cling Surface. The test shows the slack belt treated with Cling Surface does 50 per cent. more work than the tight, untreated belt.

Spaulding-Perkins Co., North Rochester, N. Y., make an interesting display of the fiber goods made by them, showing various styles of roving and cordage cans, mill boxes and baskets.

Tavella's Shuttleless Loom drew considerable attention when in operation; but difficulties yet to be overcome in the perfecting of this machine detract somewhat from its interest.

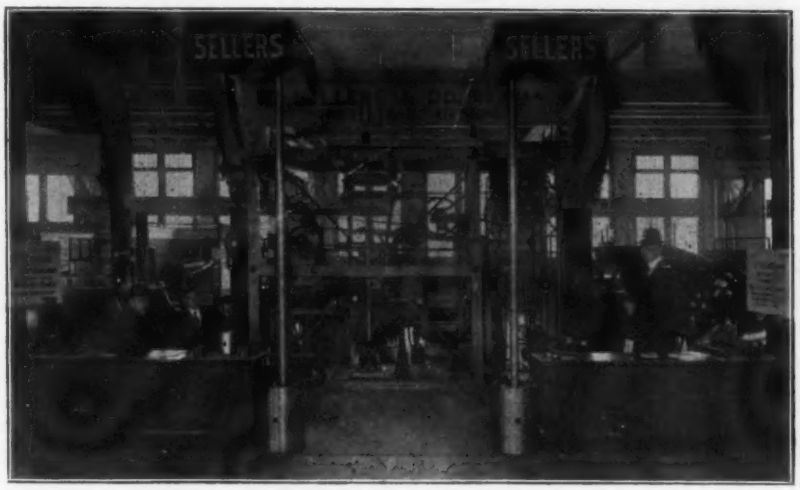


THE EXHIBIT OF THE CARRIER AIR CONDITIONING CO.

The United Shoe Machinery Co., Boston, use their favorable location for a demonstration of the work done by Merrick Eyeletting Machines for knit goods and other fabrics. A foot power and a motor driven machine are operated for the instruction of visitors. They also show an extensive line of samples of work done.

Farrington & Co., Boston, have a unique and attractive display of floor finishes in glass tubes and packages as supplied to the

trade. A number of samples of finished wood added to the interest shown in their space.



THE EXHIBIT OF WILLIAM SELLERS & CO.

Killburn, Lincoln & Co., Fall River, Mass.. decided upon a dobby loom to represent their business, and the interest shown makes their space one of the busiest in the hall. A fancy cotton, the class on which this loom is the equal of any, is being woven.

Howard Bros'. Mfg. Co., Worcester, Mass., are operating two card setting machines, one making clothing for main cylinders for cotton cards and the other making cotton burnishers and strippers. In addition they show models of the Rae system of carding and of revolving top flat card. A prominent feature of their display is an exhibition of German heddles made by them. Their card setting machine attracted much attention.

THE EXHIBIT OF THE HOWARD BROS. MFG. CO.

The Lord & Nagle Co., publishers of the Textile World Record, Official American Textile Directory, American Directory of the Knitting Trade, etc., had a large, well located space on one of the main aisles. It was furnished comfortably with desks, easy chairs, pictures, telephone, newspapers and magazines, and proved a welcome resting place for many customers and friends. The Lord & Nagle publications were displayed and a full line of books on cotton manufacturing and related subjects. Nicholson's new book on "Factory Organization and Costs," just from the bindery, was shown for the first time. (This will be reviewed at length in next issue of Textile World Record.) Another feature which attracted much attention was the display of samples of textile materials in various stages of manufacture as well as the finished product mounted in cassettes.

THE EXHIBIT OF THE ALLIS-CHALMERS CO.

THE EXHIBIT OF THE CARBOLINEUM WOOD PRESERVING CO.

The Allis-Chalmers Co. combine a high degree of utility with the excellent arrangement of their display. They have a 100 h. p. or 75 k. w. motor-generator set taking direct current from the power house in the building and transforming it to alternating current for running motors attached to machinery shown in the other exhibits. Other features

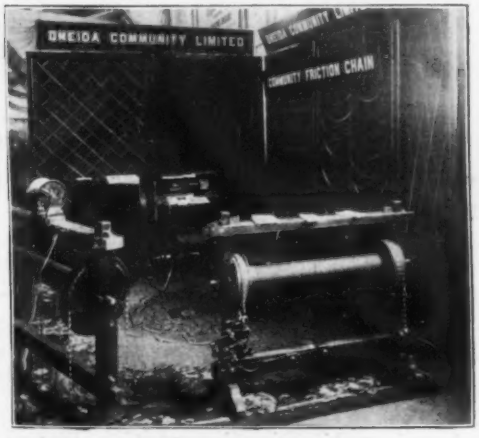
THE EXHIBIT OF THE TEXTILE MACHINERY CO.

of their space are a line of lighting transformers from 0.6 to 50 k. v. a.; balance set for multiple voltage, used principally for print works; direct current motors; induction motors, alternating current, etc.

Dodge Mfg. Co., Mishawaka, Ind., manufacturers of water softeners, clutches, hangers, "Firmus" rope, and general power transmission equipment, features Dodge capillary self-oiling bearings. They state that these bearings give more uniform lubrication at a cost for oil of 1/3 cent per year for average size bearings. In addition they displayed superior transmission equipment.

THE EXHIBIT OF THE C. J. ROOT CO.

Cooper-Hewitt Electric Co., Boston, display parts of their mercury vapor lamp showing the construction and operation. It is



THE EXHIBIT OF THE ONEIDA COMMUNITY CO.

stated this lamp has the lowest current consumption of any indoor lighting apparatus and is especially adapted to all textile work. Many of the exhibits are lighted with mer-

cury vapor lamps, and the admired Crimean Hero Tablecloth, which is a feature of the exhibit, is in this space in order to display better the design and workmanship.

Fleischman & Rose, New York, make an exhibit of pick glasses and small microscopes.

Cotton Publishing Co., Atlanta, Ga., has a space which is used as headquarters for their representatives. A model of the Disc Gin is presented.

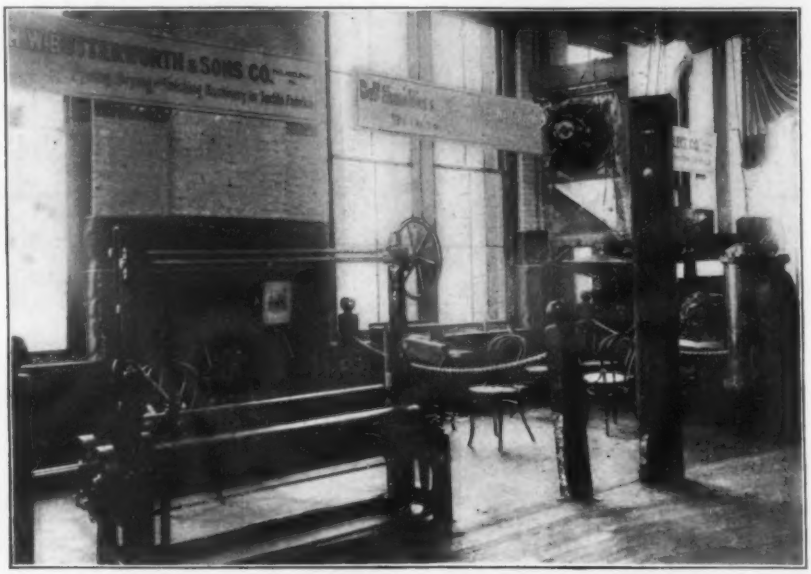
Keystone Lubricating Co., Philadelphia, have a model steam engine equipped with grease cups, and a main line shafting showing the working of their grease in ring oiling and plain bearings. They also make greases for general textile lubrication such as cylinder boxes, cams, top rolls, etc.

American No-Slip Cement Co., Boston, demonstrate the value of their cement on pulleys by a simple apparatus with treated and untreated pulleys lifting a weight by means of a belt.

A. W. Ellis, Advertising Agency, Boston, has a neatly arranged space with examples of the work they have done for clients.

Atherton Pin Grid Bar Co., Providence, R. I., present their pin grid bars for cotton openers and lappers with samples of the work done. They also show a new device for preventing split laps.

The West Disinfecting Co., Boston, have a complete display of air purifying apparatus and automatic disinfectors. A novel exhibit is a telephone disinfector.



VIEW SHOWING PORTION OF H. W. BUTTERWORTH & SONS CO. EXHIBIT, ALSO THE BELL HUMIDIFIER SYSTEM OF THE GRISCOM-SPENCER CO.

The Oakley Steel Foundry Co., Millbury, Mass., features a display of castings made at their plant. They also show a line of finished crank shafts and other products.

The Rhode Island Coal Co. demonstrates the qualities of their anthracite coal and bricquettes, the latter made from coal dust, formerly treated as refuse screenings.

Carbolineum Wood Preserving Co., New York, has an attractive space calling attention to the preservative qualities of Avenarius Carbolineum. Samples of treated and untreated wood used under the same conditions are shown to prove the life-preserving effects its use produces. They feature a treated white oak paving block for dye

houses which they are preparing to supply at the cost of common untreated blocks.

D. P. Nichols & Co. have on exhibition a large Frayer-Miller truck of the type that is coming into use for heavy teaming. Considerable interest was displayed by manufacturers in this machine.

Oneida Community, Ltd., Oneida, N. Y., present a large display of loom beam friction chains for ribbon and broad silk looms, cotton and wool and worsted looms. There is a Community friction chain for all types of looms and nearly all are shown in the exhibit. Their long wearing and non-stretching qualities, ease of adjustment, adaptability and imperviousness to dampness or dryness commend them over old style leather or rope frictions.

The Rote Co., Hartford, Conn., manufacturers of boiler tube cleaners, show an interesting line of this indispensable part of the power house equipment.

Chas. J. Jager Co., Boston, have a good display of up-to-date pumping and power equipment, including power pumps, centrifugal pumps, self-contained pumping engines, triplex pumps and gas or gasoline engines.

E. H. Jacobs Mfg. Co., Danielson, Conn., manufacturers of lug straps, pickers, Northrop loom checks, and other loom supplies, make a complete display of their products and the materials used in manufacturing them.

THE EXHIBIT OF THE WESTINGHOUSE ELECTRIC AND MFG. CO.

Jenkins Bros., Boston, have a display of valves and packings which commands the attention of those interested in the power department.

The Steam Engineering Department of the Sub Target Gun Co. is operating a Holly circulator. This is a simple device for circulating liquids of any temperature such as bleaching and dyeing liquors and chemicals. An interesting plan of the circulator attached to a bleaching kier is exhibited.

Harriman Engine Co., Boston, are operating the rotary engine which recently made the remarkable efficiency test at the Massachusetts Institute of Technology, as the basis of their exhibit. A contract has been taken to furnish a number of these machines from 10 to 20 h. p. for blowers. They also

show threadless unions, connections, bolts and nut locks.

A. S. Morss Co. are agents for "Pyrene for cotton fires." It is claimed this substance will extinguish all combustion without damaging material or machines. The chemical and container ready for instant use are on exhibition.

Leatheroid Mfg. Co., Kennebunk, Me., present a line of roving cans in which the seam rivets are all set with smooth head of rivets inside. They also display boxes, sample cases and pails.

The Coldwell-Gildard Co., Fall River, are showing the working of their electric stop motion on 36-inch print goods. A regular Whitin loom is a prominent part of the demonstration.

The Marine Motor Mfg. Co., Boston, exhibit one of their "Boston" motors of 3 h. p. capacity which they sell for $50. An interesting display of motor parts also is shown.

Brown & Wales Co., Boston, power transmission machinery, heavy hardware, conveying and elevating appliances and mill supplies, have an interesting exhibit of their lines. An extensive line of Shelby tubing is displayed prominently.

General Vehicle Co., Boston, have a heavy motor truck in space 19, illustrating the type that is displacing the horse in mill yard and general teaming.

The Textile Manufacturers' Journal, New York, uses its space as headquarters for its representatives and reception room for their friends.

Studebaker Bros. Co., of New York, exhibit a large motor truck suitable for heavy mill trucking, also an electric runabout. It is claimed there is a saving of 15 to 45 per cent. in labor cost in the use of their electric trucks for merchandise transportation.

THE TEXTILE WORLD RECORD'S QUARTERS.

Hohmann & Maurer Mfg. Co., Rochester, N. Y., feature the H & M automatic regulator to control pressure, damper and temperature. They have an auxiliary line of thermometers, recording instruments and gauges for all purposes.

Fibre & Fabric uses its space to show the modern way of setting up a newspaper. A linotype machine and printing press are features of the exhibit, which attracted much attention.

CORRESPONDENCE AND NOTES

Upon Textile Topics At Home and Abroad.

SWIVEL WEAVING.

BY JOSEPH HARGREAVES.

The origin of swivel weaving is of uncertain date; the earliest recorded was made in 1579. At that time a machine was reported to be at work in Dantzig making four to six pieces of cloth at the same time. It is presumed that this was a ribbon loom or swivel loom on account of a small shuttle being used for each ribbon produced. The common hand loom for weaving ribbons was formerly known as the Dutch engine loom and was at that time styled a swivel loom. Before this loom was invented it was the custom to weave one ribbon at a time in small looms.

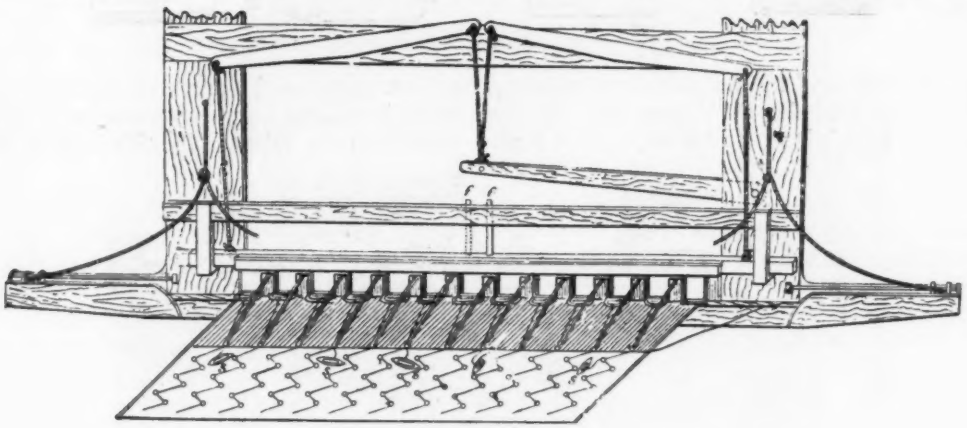


FIG. I.

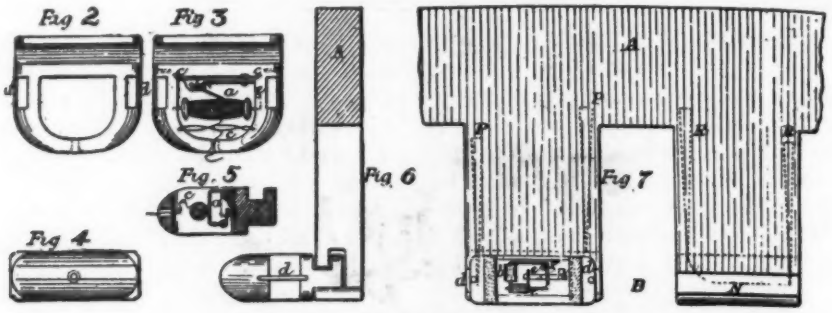
By means of the swivel loom ten, fifteen or more ribbons could be made in one loom. There is reason to believe that the ribbon loom was known in Holland about the year 1621. For a long time it had a varied career, its prohibition being proclaimed from time to time. In the year 1676 the ribbon loom was prohibited at Cologne and the same year some disturbance took place in consequence of its being introduced into England. In the year 1681 it was declared by imperial authority that the prohibition of ribbon looms was both useful and necessary. This was followed in the year 1685 by an act of the council of Frankfort. The council of Hamburg, it is said, ordered a ribbon loom to be publicly burnt, and Charles VII ordered the prohibition of 1685 to be renewed in 1719. In spite of all these drawbacks the ribbon loom made its way, receiving improvements from time to time with results that at the present time we have what we may term a fairly perfected loom.

Our application of the term "swivel" does not quite coincide with the term as formerly used. We speak of looms for small wares, such as ribbons, tapes, hat bands, suspenders, elastic webs, etc., but rarely if ever speak of them as swivel looms, which was the custom in days gone by. Generally when we speak of a swivel loom we have in mind a machine fitted with a number of small shuttles, which work in conjunction with the ordinary fly shuttle. The function of these shuttles is to sew the design on the fabric in the best possible manner with a view to the greatest economy of material.

There are a good many styles of fabrics

made in which the design is composed of detached figures, but manufactured in the ordinary way; that is, with two or more fly shuttles; one for fine filling used in the ground, the remaining shuttles for the figure, which may be a spot or flower requiring various colors of filling. By this method of weaving the filling used for the figure floats at the back of the fabric where not required to form the design. These floating threads are no part of the fabric, but so much useless material and all the filling thus floating must be sheared off after weaving, with the result that the design is presented to the best possible advantage. The drawback to this method is the rough edge of the pattern caused by the shearing of the floating threads and the great waste of material. This method of weaving is mentioned only in comparison with swivel loom production.

For neatness of effect and prominence of design the swivel method of weaving is excellent. Detached figures of cotton or silk made in various colors are neatly and clearly woven on the fabric. By this method rich silk fabrics, which approach very near to embroidery, are produced.



FIGS. 2 TO 7.

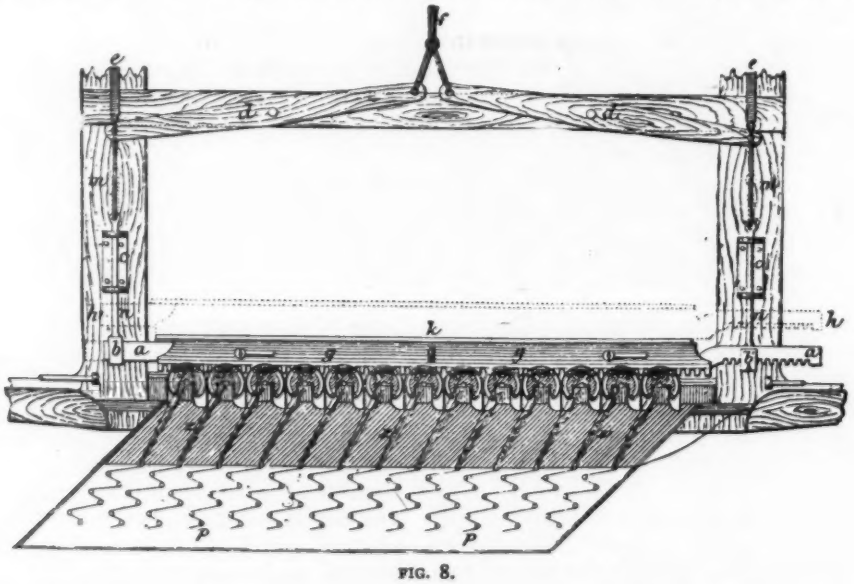


FIG. 8.

The construction of a swivel loom is much on the lines of an ordinary loom with the extra attachments of small shuttles and the mechanism for working the same. The old arrangement was to fit a number of shuttles

in a frame, which was attached to the lathe just in front of the reed and above the warp yarns. This frame could be raised when not in use and lowered when required, but being fastened to the lathe had to work backward and forward with every pick of the loom, Fig. 1.

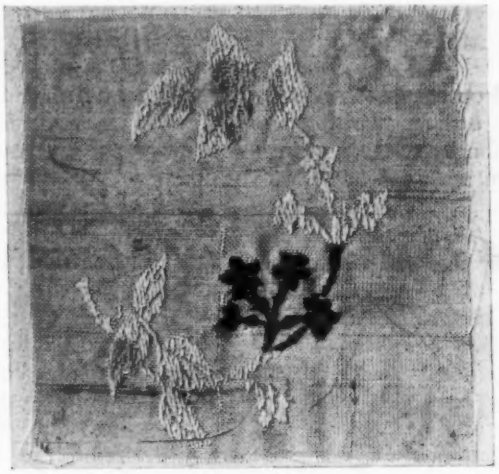


FIG. 9.

stopped and started whenever desired. The ordinary loom lathe goes backward and forward every pick, but the swivel attachment when not required is brought to a stop just over the fell of the cloth. As soon as it is time to put in the figure requiring the small shuttles the frame holding the swivel shuttles falls into action and swings in unison with the ordinary loom lathe until the swivel figure is made, when it is again brought to a standstill.

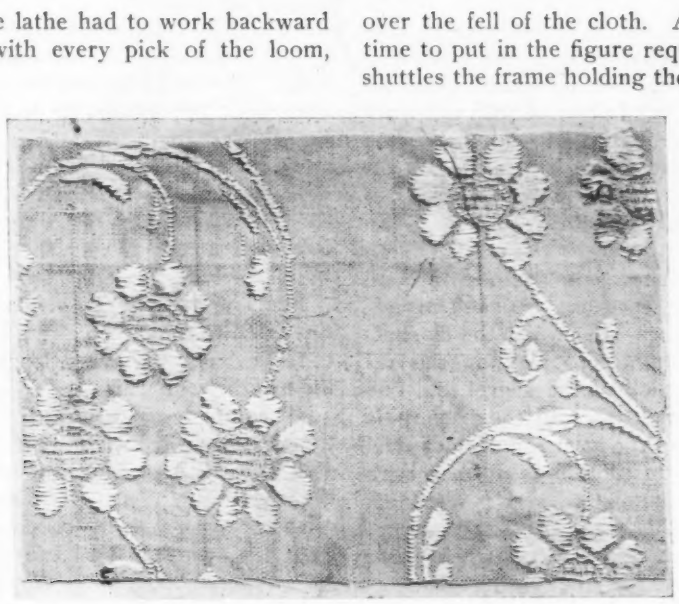


FIG. 10.

The loom of today is of much better construction. When the swivel effect is not being woven the frame holding the shuttles is at rest, the swivel frame being worked from its own cranks, and can, therefore, be

The simplest frame for holding the swivel

shuttles consists of an arrangement for holding a number of shuttles at convenient distances from one another. For elaborate work it is arranged to have three banks of shuttles; that is, three shuttles, one above the other, so that if necessary a design with three colors of filling can be produced, as shown at Fig. 9.

The filling is wound on a spool very similar to that used in an ordinary sewing machine, secured in position by suitable springs, Fig. 3. In connection with this loom is a jacquard, which lifts the warp threads according to the design required; it also manipulates all the levers and mechanism connected with the loom. It puts the swivel frames in motion and determines the order in which the colors shall be placed in the design when the jacquard operates the swivel shuttles in the required order. It stops the fly shuttle by pulling a lever, which prevents the picking motion from making its usual stroke.

Let us suppose a design is to be woven, requiring 150 picks of fine filling for the ground and 20 picks for the figure made with the swivel shuttle. During the 20 picks for the figure the ground or fly shuttle will work alternately to keep the ground intact and also act as a binder in the figure; during the time the loom is working the 150 picks of ground the swivel shuttles are at rest. Then the picking motion will be put out of action while the swivel shuttles insert one or more threads of filling according to the requirements of the pattern, after which the fly shuttle is again brought into play; in this instance, say one pick of the swivel and one pick of the fly shuttle, until the pattern is complete. During the insertion of the swivel thread the take-up motion is at rest, with the result that a compact figure is obtained.

There is another kind of swivel loom, which is called an embroidery loom because of the resemblance of the product to embroidery. In this loom the shuttles are placed at right angles to the reed. The spools holding the filling are similar to the spools used in an ordinary sewing machine. Only those shuttles required for the pattern are used. An all-over effect or a stripe can be made by omitting shuttles. Underneath each swivel shuttle there is a wooden guide projecting which has the appearance of a short horn. Its function is to make an opening into the warp through which the swivel shuttle passes when the jacquard machine opens the shed and the shuttles have passed through the openings made in the warp threads by the guide. These shuttles move through the shed to the opening next to the one they entered and so the thread is inserted or whipped around the warp threads, which are raised by the jacquard within the space of the travel of the swivel shuttle.

A perpendicular wire lever is attached to each shuttle. One end of the lever is fixed between two pins upon the motion bars, the other end resting on the shuttle, the fulcrum being between these two points. When the bar is pulled the shuttles move in the direction desired, either to the right or left.

In this loom the picking motion and the swivel shuttles are so arranged that one is out of action when the other is in action. All the motions are worked from the jacquard; the picking motion is so arranged that when the fly shuttle is being propelled the picking shaft strikes from both sides of the loom at the same time so that from which ever side the fly shuttle is resting its delivery to the other side is assured. The take-up motion is at rest during the insertion of the swivel thread.

Fig. 1 illustrates 12 swivels or small shuttles fitted to the lathe; Fig. 2 is a plan of one of the swivels; Fig. 4 is a front view showing the eye through which the filling passes; Fig. 3 is a complete swivel shuttle; Fig. 5 is a sectional view of a swivel shuttle; Fig. 6 is a side view of the swivel shuttle; Gig. 7 shows the space into which the warp threads are raised in order that the shuttle may pass underneath and thus form the design; Fig. 8 shows an arrangement of circular shuttle swivel weaving; Fig. 9 is a design made on a 3-bank swivel loom, the stem and flower portion being woven in red, gold and green silk; Fig. 10 shows a design in silk woven on a swivel loom.

CARDING COARSE WOOL AND SHODDY.

BY GUNNAR NILSSEN, Aalgaard pr. Stavanger, Norway.

(Continued from April.)

The finisher and breaker have the same kind of breast, and it would be difficult to get the material properly carded without them. The finisher has a four tier rubber tape condenser. This is the number of rubbers generally used in connection with the two doffer card. For three run yarns and upwards it is advisable to employ a six tier rubber tape condenser. The fine counts necessitates a fine pitch on the condenser, owing to the difficulty of getting the films thin enough. Although a four tier rubber tape condenser can be made to any pitch, there is always the liability of the ends of roving running together on account of the short intermediate space between the tapes, if the material carded contain long fibers. Moreover the reciprocating motion of the rubbers is reduced too much if the ends of roving lie too closely together.

The two doffer card shows up at its best on two and two and one-half run yarns. It is also used on cotton and half wool knitting yarns up to three run or more. It will proportionally have its greatest production on one run cotton waste or half woolen yarns for blankets, etc., and it is in this case possible to get twice as large a production as with the ordinary single doffer card. From 1,000 to 1,200 pounds of material for one run yarn can be put through the cards in ten hours. The production is a little less on wool and shoddy yarns and decreases as the material gets finer and requires more carding. The production of any card is a product of quantity and quality. If one of the factors of this product is increased the other is proportionally lessened. Should the quantity of the production be increased above a certain point, the quality will be poorer. It is not advisable to card mungo

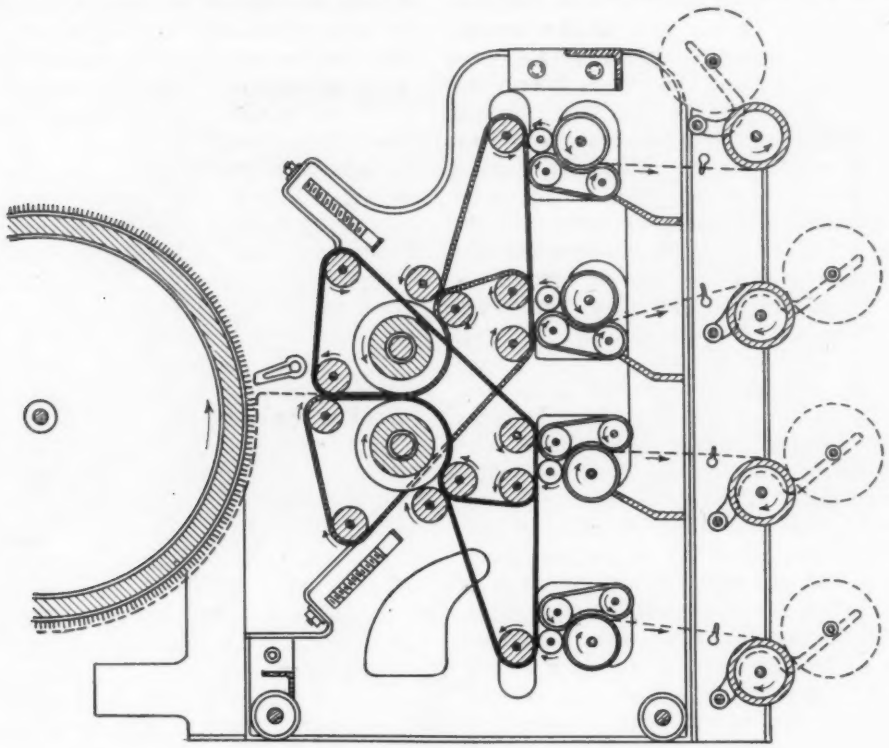


FIG. 4.

on the two doffer card. For this fine, low material there is nothing to surpass the English system of carding, not as regards quantity, but as regards the ability to produce serviceable yarns from inferior material.

The leather tape condenser was put on the market in the early sixties by the well known Belgian inventor of textile appliances, Celestin Martin of Verviers. It contributed much to the rise of the woolen spinning industry of Belgium, whose spinners at first derived large profits from the use of it. The tape condenser in its various constructions is now generally adopted on the Continent and is being steadily adopted in England.

It surpasses every other contrivance for dividing the film of wool produced by the card. Shortly after the introduction of the tape condenser the inventor also put on the market the so-called steel blade condenser, by which the film of wool is divided into strips by running in between thin steel blades, partly encircling outer rubbing leathers. Although the steel blade condenser has been extensively used, it has not displaced the leather tape condenser, whose adaptability to all kinds of material and counts of yarn, as well as its true and exact working, and the easiness with which it is kept in order, are universally acknowledged.

Fig. 3 shows a cut of the leather tape condenser. The film of wool taken from the doffer first goes below a leading roller and then in between the dividing cylinders, A and B. These cylinders are made of rings of larger and smaller diameters put upon a shaft. The projecting rings of the upper cylinder are opposite the grooves of the lower and vice versa.

The leather tapes, H, which fill the grooves of the cylinders, follow the grooves of the cylinder, A, to the point where the cylinders touch each other. From here the tapes, H, pass over on the projecting rings of the cylinder, B, and from this cylinder around leading rollers, E and T, to the rubbing leathers and over roller, T, back to cylinder, A. The tapes, g, follow the grooves of the cylinder, B, cross over to the rings of the cylinder, A, and round rollers, C, D and K, back again to the cylinder, B.

As the film of wool passes in between the dividing cylinder, parts of it, on account of the crossing of the tapes, alternatively pass between tapes, H, and rings of cylinder, B, and between tapes, g, and rings of cylinder, A. Thus the film of wool, as the rotation of the cylinders and tapes goes on, is gently and securely divided into ribbons of uniform size. These ribbons, held tightly between

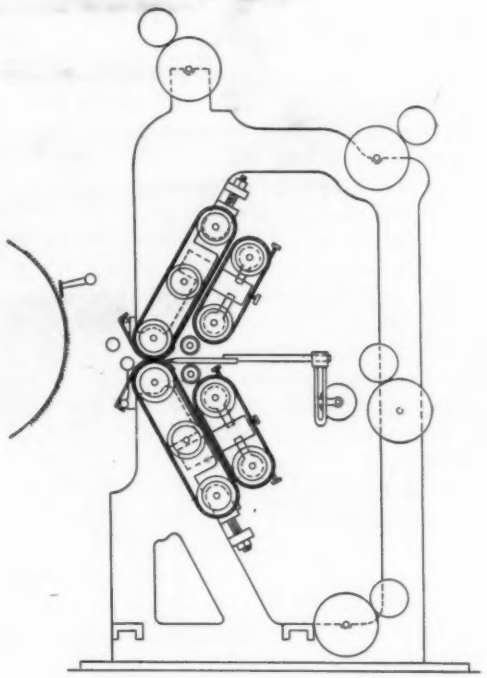


FIG. 5.

the tapes and rings, follow the tapes to the stripping rollers, which deliver them to the rubbing leathers, and from these the roving passes to the spools. The tapes are given one-half turn between rollers, T and T, and between rollers, D and K, in order to give more room for the fluffy ribbons of wool adhering to the tapes at the point where the latter cross each other.

Fig. 4 shows an improved form of the tape condenser, invented by E. Gessner of

Aue, Germany. The film of wool is fed in between the nearly parallel tapes, where it is only slightly stretched until it is firmly laid between the tapes and the rings of the dividing cylinders. At the point where the empty running part of the tape crosses the part of the tape with the wool on, the ribbon of wool is held securely between the tape and the ring. This does away entirely with the possibility of having the ribbon of wool taken off by the returning tape. In the older condenser the tapes were subjected to more wear and tear, as they were led over surfaces of unequal diameter, namely in the grooves of one cylinder and on top of the rings of the other. This, of course, produced a certain amount of slipping, and shortened the life of the tape.

The chief advantages claimed for the four tiered rubber tape condenser are as follows: Greater production by doing away with the possibility of the end of roving running together; a finer pitch can be used, which makes the spinning of finer counts of yarn possible.

Fig. 5 shows Celestin Martin's steel blade condenser. The thin steel blades lie close to the front part of the rubbing leathers, as shown. The upper row of blades extend across the card and fit in between the intermediate spaces of the opposite ones. As the film of wool enters between the steel blades and rubbers, parts of it are alternatively exposed to and carried on by the leather hose. Only the inner rubbing leathers have a reciprocating motion on this condenser. Fig. 6 shows an improved steel blade condenser. Although the steel blade condenser is simpler and cheaper than the leather tape condenser, and is doing good work, especially on rather short material, it is going more and more out of use, and is only retained in places where it has been long established.

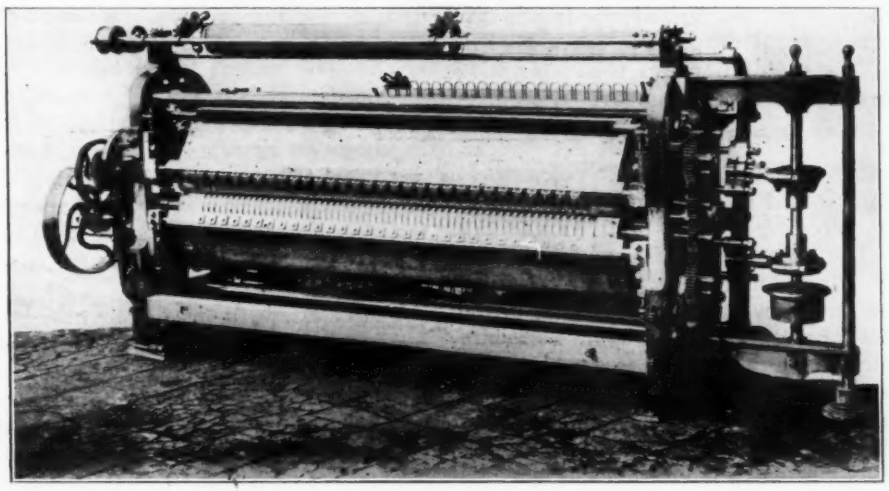


FIG. 6.

In regard to quantity of cotton produced Egypt ranks fourth; in regard to quality it ranks next to Sea Island.

During the reign of Edward VI an act was passed for preventing frauds in the woolen manufacture of England in which it was averred that clothiers, "some for lacke of knowledge and experience, and some of extreame covetousness, do daylie more and more studdye rather to make money than to make good cloathes, having more respecte to their private commoditie than the advancement of truthe and continuance of the commoditie in estymacion accordinge to the worthynes thereof."

ENGLISH NOTES.

By Our Special Correspondent.

The proposals of the Payne bill have reached England in too piecemeal a manner to make final judgment on them possible. An anticipation that the revision would not amount to much was general and in face of the large American purchases of colonial wool, people in the wool trade found it hard to believe in any readjustment of the wool tariff. Cotton traders were unprepared for the addition on mercerized goods and are sarcastic over the proposal to count plies as picks. Their objections to this innovation will be heard of through importers.

• • •

A review of the American woolen trade by U. S. Consul Bright of Huddersfield was found interesting by the local Textile Society. The address was of facts, figures and history, with comments by the way, involving comparison with the development of the American cotton trade. About Yorkshire trade the Consul said "there could be no doubt that the highly localized condition of the industry stimulated invention, brought together a large class of skilled workmen, promoted efficient organization and effected economies by the easy interchange of products and materials between the various branches of the trade. The industry became more flexible and adaptable to changing conditions." A tendency to concentrate was noted in the United States.

Americans will see the benefits and convenience of the choice the Yorkshireman has at hand. Does he want wool combing, rag pulling, special carding, spinning, dyeing or a firm to weave for him for a few weeks on commission? The facilities are there at his elbow. The proximity of them all is more advantageous than can readily be stated in terms of money. Then see how the Yorkshireman is placed for the transport of his cloths. The railway will deliver tonight's shipment before noon tomorrow at any port in the country or to practically any town to which cloth in bulk is ordinarily sent. Rail rates may seem high, but the trader gets a service for them.

The international committee on the vegetable fiber in wool nuisance agree that jute bags are much poorer now than ten years ago in point of quality. They confirm the opinion that the chief cause of jute burls is the fraying of bags and pass these judgments on the improved bales put before them: "Wool-lined packs are best; paper-lined packs (of a kind) are eminently satisfactory; cotton-lined packs are bad; good quality jute bags and singed jute bags present some advantages; sizing jute bags makes no real improvement."

The Australian tariff brings imported woolen bag linings up to 38 cents, making the lining an expensive addition. Paper lining costs 18 cents a bale, for which charge good, thick, corrugated material is obtainable. Experiments with thin paper linings fastened down with glue brought no satisfaction. The woolen lining indicated is a cheap elastic stockinette fabric.

The committee point out that the best baling inevitably helps the seller towards the best price for his produce and that bad baling, entailing extra cost on the manufacturer, is ultimately a tax on growers of wool.

• • •

The attention of some dyers has been turned to the production of unshrinkable finishes by publication of a paper on the chlorination of wool. It is in a bath of hypochlorite of soda acidified with hydrochloric acid that knit goods are made unshrinkable usually. An advertised finish for flannels, pajama goods, etc., is already popular. The field for "unshrinkables" in trades where goods are woven wide in order to finish to the correct weight is restricted and it is doubted whether any chemical means will be an all-round improvement on full-shrinking in the accustomed way.

A trade paper reproduces the complaint of an American jobber that American worsteds have shrunk unduly this season. Asked for their opinions, two English finishers are disposed to blame the rotary press, saying at the same time that this should not be more provocation of shrinking in one season than another. Speaking of his experience of ro-

tary pressing heavily-picked merino suitings, one says that the lowest degree of tension pulls an inch a yard out of the goods and will easily pull more out of loosely woven fabrics. Manufacturers seldom or never use the rotary press themselves, but these machines are used in Leeds & Huddersfield dye works. Pressing at width is followed by pressing in folds between hot papers and this addition causes some take-up of the length.

* * *

"Unspotable" finishes are again highly popular and quantities of dress goods are warranted not to spot, cockle or shrink. Repeated crabbing or steam-blowing is the reputed basis of the most successful. The treatment is administered gently without much blowing at one time. It is questioned whether the claim of unspotableness holds good on the very highest finishes, efficacious as it is on dull and medium ones. Assuredly there are unspotables which spot badly after rain and there are sellers who will underwrite the risk of claims for damage at an advance of a penny or so a yard and who will submit the cloth to no special treatment whatever.

Thousands of "rainproof" coats with no rainproofing whatever on them were sold a few seasons back and they did the genuine trade an injury from which it still suffers.

* * *

A new woolen and worsted loom by the largest Bradford makers is looked on favorably by practical men, not because of any new principle present, but as an embodiment of the strong points of the best approved Keighley & Huddersfield types. From different sides we have been hearing a great deal about looms. An anonymous writer appeals to the best designers of machine tools to consider new and noiseless looms and connects noise with wear and waste of energy.

Professor Beaumont of Leeds has been praising the advantages of mechanical parts over twine and straps in heald mounting. Then on the subject of the cotton loom one inventor and another have been airing their several theories. Give the automatic the bad filling and the regular Lancashire loom the good and then make comparisons urges one. Use long tubes for filling says another. What are wanted are my ingenious improvements, interpolates a third.

If the discussion has not made much progress it is at all events a proof that the improvement of loom types is once more in the air. Lancashire is hungering to recover some of its lost business in coarse cloths. Yorkshire is thirsting to get costs down. Let it be hoped that the effort will not end with the flotation of a company which proposes to save about twice as much per yard as weaving usually costs. The last to propose to do so ended ignominiously.

* * *

Worsted is supposed to owe its very name to the village Worsted in the English county of Norfolk and to within a hundred years ago the county-town, Norwich, was Worstedopolis. There were in the county in 1770 towards 12,000 looms and today there are just three crape factories and they use silk. The decay of the trade in East Anglia has been sketched by Professor Clapham, who finds that it was killed by coal and steam, the competition of cotton, a strike and the superior enterprise of the Northmen in adapting machinery. Its last days were smoothed by a steady colonial and East Indian trade which gave a false sense of safety that was only broken when the old East India Company lost its monopoly. In the last year for which returns exist there were in the United Kingdom 841 worsted factories having 2,823 combs, 2,937,900 spinning spindles and 52,725 looms. The totals will be under the present mark. The figures as to plant belong to 1904 and the following American figures by Consul J. F. Bright are dated 1905. These give America 226 worsted factories with 1,549 combs, 1,618,207 spindles, 30,910 looms and 69,251 wage earners.

* * *

Blackburn is a weaving town producing dhooties, cambrics, shirtings and so forth, principally for India. Its spinning mills employ half-timers largely and its weaving sheds employ women. Medical officers in

the district thus have a fair chance to judge of the physical effects of mill life. One of them, Dr. Barr of Rishton, says on the question of abolishing half-time labor:

"Let us begin at the proper end. The first year is physically the most important in a child's life. I say it is far better that the children should go to work at twelve years than that the mother should be taken away from the young baby. I would permit the strong, healthy child to work, but I would allow no married woman to work in the mill for three months before confinement or for nine months after."

Speaking from 25 years' experience of labor certification, Dr. Barr calls the average mill "healthier than the average school and much healthier than the average house."

SILK THROWING.

BY JAMES CHITTICK.

(Continued from April.)

Some silk for chiffons, etc., is twisted very hard, say 80 turns per inch, in the single and is used in that shape for both warp and filling. Organzine is sometimes made with three or more threads, instead of two threads. Tram is sometimes twisted harder for special purposes. These are all for minor uses, almost the entire quantity of the reeled silk imported being made into regular tram and organzine as described.

The color of most cultivated raw silks is generally either white or yellow. Broadly speaking, all the China, Japan and Levantine silks are white, while the Europeans are yellow. Silk contains an animal gum, the sericin, which can be discharged from it by boiling it off in soap and water, and the yellow color alluded to is in this gum, the insoluble part, called fibroin, being as white in the yellow silk as it is in the white. The amount of this soluble gum in Japanese silk averages about 18 per cent.; in China silk, about 19 per cent.; in yellow Europeans, about 24 per cent.; and in Tussah silks of good quality, about 15 per cent. Low grade Tussahs will lose much more. Some regular silks are also described as brown and green, having a faint tinge of such color about them, but they are practically white.

The Tussah silks are brown in color and are made from the cocoons of wild or semi-wild silk worms which feed largely on a species of oak leaf. They come mostly from North China and India, and are coarse and strong silks, but difficult to work and dye.

The percentage of gums given above are averages, as the amounts in individual lots will vary considerably.

Thrown silk still retains these animal gums, as well as the added soap and oil, so that it is in consequence not a very lustrous looking product. When the dyer boils away the gum as a preliminary to coloring it, then the true beauty and lustre of the silk appear.

Good qualities of silk should be strong, nervy, elastic and regular, while poor qualities are the reverse. The nature of some silks is also markedly better than that of others, and the peculiarities of the various kinds will make them specially fit or unfit for different purposes.

The best silks in the world are probably the highest class of the white or yellow Italian silks raised in Piedmont, and the best white China silks reeled in the establishments conducted on the European plan and called steam filatures. The best grades of Japan silks are nearly as good. A great deal of very good silk is produced in the other Italian provinces, but there is also much low grade silk sent out of Italy. Very fair silk is reeled in Italy from the white cocoons grown in the East, that is in Asia Minor, Turkey in Europe, and the adjacent countries. Comparatively little of this crop is reeled where it is produced, most of the cocoons being sent to Italy. The French Cevennes silks are very good, but are somewhat more hairy in nature than is desirable for some uses. Spain, Hungary, and Sicily also produce some very good yellow silks. Canton silks from South China are soft, lustrous, and very hairy, and on account of this hairiness their uses are distinctly limited. White China silks, known as Tsatlas, reeled in the native fashion, while of excellent nature, are much too irregular to be generally used.

The cost of throwing Tastlas and Cantons is in excess of the cost of throwing or-

dinary silks, and five or ten cents a pound extra is charged for this work, while the charge for throwing Tussahs is quite high and depends on the character of the lot.

Good cocoons, poorly reeled, will make very poor raw silk from the manufacturer's standpoint, while indifferent cocoons, very well reeled, may make an entirely satisfactory article.

Some of the defects that may be found in raw silks are as follows: Irregularity of color, irregularity of size, extremely thick places and extremely fine places, slugs, nibs, loops, irregularly reeled skeins, poor crossings, deficiency in strength, deficiency in elasticity, excessively hard gums, hairiness, broken ends and lack of cohesion of the individual filaments.

In speaking of the gums in raw silk it will be understood that the cocoon filaments are drawn off the cocoons in a wet state. As the threads into which they enter revolve around the reel on which they are taken up, and which runs in an enclosed casing heated by steam pipes for drying the silk, they will naturally become squeezed together at the places where the threads press against the arms of the reel. When the dry skeins are removed from the reel, these places may make hard bands of gum running across the skein at which points nearly all the threads are stuck together. When softened in warm water the threads can be separated and opened out, but the freer the gums the more desirable it is. The gums in yellow silks are generally harder than those in white.

In many reeling establishments efforts are made to keep the water as gummy as possible in the basins in which the cocoons float, so that the silk will take up an extra amount of this soluble material in the reeling, and give a greater number of pounds of reeled silk for a given number of pounds of cocoons. This is not exactly a fair practice, but it is much resorted to and the result is seen in those lots of silk which show an extremely large loss in boiling off; such silks, too, will naturally have extra hard gums.

In Europe more care is taken than in the United States regarding the sorting of raw silks and the cleaning of them before commencing the throwing operations. The object of sorting is to achieve a greater regularity than could otherwise be arrived at. While even well reeled silk will vary more or less in size, in the same skein, different skeins will also vary in size. An experienced examiner can tell at a glance whether the silk in a skein seems to be heavier or finer than the lot, or whether it appears to be fairly well on the average of the size. If a lot of say 13/15 denier silk was assorted in this manner, the result of the sorting might show perhaps 70 per cent. of average size, that is 13/15 denier, 20 per cent. of a coarser size, say 14/16 denier, and 10 per cent. of a finer size, say 12/14 denier. Of course there is no special proportion to be counted on. Now it is evident that a silk which has been sorted in this way will give a more regular thread when thrown than an unsorted one, and where great perfection of fabrication is necessary it is well to have this sorting done. This practice has one grave drawback, however, which prevents it from being followed generally in this country. It puts out of the line of use the finer and coarser lots so sorted out, so that if a manufacturer had 100 bales of 13/15 denier silks to throw into organzine for a certain purpose, and if he had it processed without sorting, he would get a corresponding quantity of thrown silk that he could use in all the goods for which it was intended. If, however, he had this lot sorted, as above, he would find that he had only 70 bales that he could use for that purpose, more regular it is true, but still not bringing him any more money. At the same time he would have 30 bales of a coarser and finer size which he would have to keep in stock until he found some other chance to use them.

The goods of all kinds imported from Great Britain in November, 1908, were valued at $141,656,437, a decrease of $32,633,738.46 as compared with last year. The exports of cotton yarn dropped from 22,506,700 lbs. in November, 1907, to 11,486,900 in November, 1908. In November, 1908, 378,952,400 yards of cotton piece goods were exported as compared with 516,375,200 yards in November, 1907.

HUMIDITY AND VENTILATION IN WEAVE SHEDS.

(Preliminary Report of the Investigating Committee appointed by the British Government.)

(Continued from April.)

It has been clearly proved that work in moist atmospheres at high temperatures is really and seriously uncomfortable for the workers, and possibly in the long run injurious to their health. They think that if, in places where no artificial humidity is introduced, a standard of 15 volumes of carbon dioxide in 10,000, or 11 volumes in excess of the outside air, whichever is the greater, is allowed during daylight, there will be a strong inducement for manufacturers now introducing humidity, to discontinue its use, and they are further of opinion, after the evidence quoted in this report, that the standard suggested will not cause injury to the workers.

During the period of the day affected by the use of gas or oil for illuminating purposes it is suggested, on the analogy of the standard already proposed for humid sheds, that a standard of 23 volumes of carbon dioxide in 10,000, or 19 volumes in excess of the outside air, whichever is the greater, should be adopted provisionally, but in view of the lack of data as to the amount of carbonic acid actually present in dry sheds during periods of artificial illumination, it is recommended that determinations should be made in certain of such sheds in the course of the present winter, and a new standard formulated if necessary on the results obtained.

In dry sheds it does not appear that mechanical ventilation is in general use, although in a few works plenum and exhaust fans were found, but these are seldom used in winter. Natural ventilation, that is to say, such ventilation as can be secured by windows and apertures that can be opened and closed, seems to be considered sufficient, and it is somewhat astonishing under such conditions that the atmosphere in these sheds, especially in winter, does not show worse results than those given.

In certain works in the Nelson district a method of mechanical ventilation was tried; instead of having a limited number of plenum fans running at high speed, a large number of smaller fans running at low speed were installed, and it was assumed that when running at low speed the draught would be inappreciable. This, however, was not the case; the workers complained and the fans were stopped. Evidently the cause of the discomfort arose from the fact that the air at a low temperature, and in the form of draught, impinged on the persons employed. Had the incoming air been previously passed over radiators, and had care been taken to prevent a direct draught from falling on the workers, the results would presumably have been different.

In the opinion of the committee it is desirable that, following the precedent of the regulations for the spinning and weaving of flax, for the spinning and weaving of hemp and jute, and for wool sorting, which require that

"No person employed shall be exposed to a direct draught from any air inlet or to any draught at a temperature of less than 50° F." It should be enacted that arrangements shall be made that no person employed shall be exposed to a direct draught, and that the incoming air from the ventilating inlets shall be warmed sufficiently to ensure the comfort of the workers and to obviate risk of chill. Finally, the committee concurs in making some further recommendations in connection with certain matters, which, although not directly referred to them for consideration, have nevertheless an important bearing on the health and comfort of the operatives.

Though questions connected with the purity of water used for the generation of steam in the weaving sheds do not form a direct part of the reference, it is obvious that no system of ventilation can be efficient, unless means are taken to prevent the introduction with the steam of organic impurities, whether volatile or otherwise. Attention was called to this in the report of the Roscoe committee, but complaints have been made from time to time by the operatives leading to special enquiries by the inspecting staff.

Section 9 of the Act of 1901 requires that "The water used for the purpose of producing humidity shall either be taken from a public supply of drinking water or other source of pure water, or shall be effectively purified to the satisfaction of the inspector before being introduced in the form of steam into the factory, and all ducts for the introduction of humidified air shall be kept clean;" but there has been considerable divergence of opinion as to what may be considered pure water, and whether it is sufficient to require that water shall be effectively purified to the satisfaction of the inspector. Pure water does not exist in nature, and different inspectors may hold different views in regard to what should be done to secure that the water is effectively purified.

Steam from water in boilers filled from an impure source may, it is said, carry with it into the sheds volatile organic matter. It has been suggested that this could be detected by the sense of smell, but it would be very difficult to convince a bench of magistrates that an infringement of this requirement had occurred if the evidence consisted solely of the opinions of the two parties on this point.

Dr. Ransome, in his evidence given before the committee, stated that he and Sir Henry Roscoe were of opinion that the word "potable" should be used in defining the water for humidifying; the committee, however, foresees difficulties in the adoption of this suggestion, since in districts without a public supply, where the drinking water is necessarily procured from wells, or similar sources, it might be held that such water is to be considered as the potable water of the district, although unsuited for use as the humidifying agent.

In many mills where the cost of town's water for use in boilers is prohibitive, or where pure water is nnavailable, a device known as a second boiler has been adopted; this boiler is filled with town's water, or the purest water available, and is heated by steam pipes from the main boiler, the steam generated in the small boiler being used solely for humidifying. An unfortunate but solitary accident, due probably to some neglect, and entailing the bursting of one of these small boilers, did much to discourage the introduction of this useful appliance.

With the assistance of Frank Scudder, and after much consideration, a standard of purity for the water to be used for humidifying purposes was agreed upon between the Home Office and the manufacturers' associations, and this has been the guide since that time. After securing technical advice the same standard was accepted as satisfactory by the Belfast Flax Spinners' Association, and was embodied in the regulations made in 1906 for the processes of spinning and weaving flax and tow. The regulation referred to is the following:

> No water shall be used for producing humidity of the air . . . which is liable to cause injury to the health of the persons employed or to yield effluvia: and for the purpose of this Regulation any water which absorbs from acid solution of permanganate of potash in four hours at 60° more than 0.5 grain of oxygen per gallon of water, shall be deemed to be liable to cause injury to the health of the persons employed.

It is recommended by the committee that this standard should be adopted as the legal standard for water used for humidifying in cotton cloth factories, and that in the case of water taken from a source other than a a public supply, periodical tests as to its purity should be made, especially during the summer months.

The recommendations made by the Roscoe committee relating to the provision of cloak-rooms appear to have added to the general comfort of the workers, but a very large number of sheds remain in which no such legal requirement exists; in these the clothing not worn during working hours is frequently hung up on the pillars and against the outside walls, when in humid sheds, especially owing to condensation, it is liable to become damp and unsuitable for wearing when leaving hot rooms to go out into a cold atmosphere.

To require cloak-rooms for the use of all workers employed in humid weaving sheds would appear to be a reasonable solution, but practical difficulties exist. In many of the older mills it is impossible to find sufficient space for the erection of suitable

cloak-rooms, and rooms other than suitable will not be used by the workers.

(To be continued.)

THE MILL REPAIR SHOP.

BY CANTERBURY.

I will select a mill of 28,000 spindles and 700 looms as a basis for my remarks. The location of the shop is the first thing to be considered. It is a mistake to locate it in some out of the way place, in a dark corner or basement. The repair shop should be given as much consideration as any department of the mill. It should be easily accessible to all parts of the mill and should have good light and room enough to handle the work properly. It may be situated in a building outside of the mill as was the repair shop which impressed the writer as an excellent solution of the problem. The building was of concrete blocks two stories in height with the first floor concrete and the second floor planks on steel beams. The building had a truss roof covered with oiled canvas, there being no posts. All of the shafting was suspended from the ceiling of the first story, the machines on the first floor being driven from overhead and those on the second floor through the floor. The blacksmith shop was at one end of the first floor, separated by a concrete wall from the rest of the floor, which was used for the machine shop. The second floor was used for the carpenter shop and had a room partitioned off for an office for the master mechanic with a large window back of the draughting table. This is but one of many examples of convenient arrangements that are possible.

If the mill is driven by electric power, an independent motor is the proper thing, arranging the mill with connections so as to take power from outside sources. This is very convenient in case the mill is not running and there is no steam up. It is also a good plan to have a gas or gasoline engine. In the absence of this auxiliary there should be a small steam engine which can be run in case of a break down. Another very convenient power appliance is a small dynamo for lighting the repair shop in case of night work.

The machine equipment of a repair shop depends largely on the equipment of the mill, and as far as possible should enable the repairs to be made without aid from the outside, except for foundry work. Following is a list of useful machines: A lathe that will handle pulleys up to 60 inch diameter by 24 inch face; a shafting lathe that will swing 20 feet between centers with a screw cutting attachment; two engine lathes, 6 feet by 16 inches, both to have screw-cutting attachments and one of them to have taper turning and boring attachment; a speed lathe 48 inches by 12 inches; a universal milling machine; an upright drill or better yet a radial drill; a planer 36 inches by 36 inches by 96 inches; a two wheel wet emery grinder. For the carpenter shop: A circular saw; a hand saw; a buzz planer; a pattern maker's lathe; a boring machine; and a grind stone. For the piping and plumbing: A 6-inch pipe cutting and threading machine. For the blacksmith shop: A good power blower; a bolt threading machine; a nut tapping machine. There are, of course, other machines that under certain conditions add to the economical efficiency of the shop. For example, in one mill there was a turret lathe, which was kept busy from 45 to 50 hours a week. In another mill there was a turret lathe that was not running over 10 to 15 hours a week, in which case the machine would not pay the interest on the investment.

The number of machinists, carpenters and other help needed varies in different mills. Following is an estimate: A machinist to look after the card room work; one for the spinning room; one for the weave shop; one for the cloth room, dye house and all around work; two carpenters to care for endless belts and wood work; a blacksmith; a piper and an all around man for helper wherever needed. These make a good complement of help for a mill of the size named.

A manuscript in the British Museum bearing date of 1562 shows that "knytt" hose, short stocks, weighing five pounds to the dozen pair, were valued at four shillings per pair, long hose, weighing six pounds to the dozen were worth five shillings per pair.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring ,not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Constant on an Alsatian Comber.

Editor Textile World Record:

Will you kindly inform me how to find the constant on an Alsatian comber like that on a drawing frame? Ashley (1067).

There is no such thing as a constant on an Alsatian comber like that on a drawing frame, or speeder or any other machine. Of course the draught can be figured as on any other machine by dividing the speed of the detaching apron by the surface speed of the feed roller. This, however, would be of absolutely no benefit to your inquirer.

Mit Afifi.

Seconds on Underwear.

Editor Textile World Record:

Please advise us what is the average percentage of seconds and waste on ladies' cotton ribbed underwear for a 6 1/2 lb. carded yarn garment, an 8 lb. combed yarn garment, and a 1/4 lb. Richelieu and 2 by 2 straight cloth. What are the piece work prices paid by Pennsylvania and New York State mills for seaming across the shoulders, sewing in sleeves and gussets, sewing neck edging, shelling front, button holes front, button sew front and crochet bottom? On pants what are the piece work prices paid for sewing bands, sewing buttons and botton-holing? All the above refers to ladies' shaped goods. On ladies' low-necked sleeveless gauze vests, what are the prices paid for seaming across the shoulder straps, for sewing edging, taping, and crocheting bottoms

Salem (1068).

I have no exact data as to the percentage of seconds on ladies' underwear, but the average percentage of seconds will run from 3 to 7 per cent. If the mill does not exceed 3 per cent. of seconds on any of these lines they are doing very well. On the other hand if the percentage of seconds exceed 7 per cent. they are likely to be manufacturing at a loss, as owing to the very close competition in all classes of knit underwear, either men's or ladies', the margin of profit is figured so very close that it would be entirely wiped out by the loss on seconds should they exceed 7 per cent. Most manufacturers figure on about 5 per cent. of seconds.

The following are the present prices on piece work paid in New York mills. I am unable to give the price in Pennsylvania mills. There are two different prices paid in New York mills on ladies' vests and pants:

No. 1.

Vests.

	Price per doz.
Seaming across shoulders	.008
Sewing in sleeves and gussets	.035
Sewing neck edging	.011
Shelling front	.0075
Button holes, front	.001
Button sew front	.01
Crochet bottom	.01
Total	.0915

Pants.

	Per doz.
Sewing bands	.085
Sewing buttons	.01
Button holing	.01
Total	.105

No. 2.

Vests.

Seaming across shoulders and Sewing in sleeves and gussets	.035
Sewing neck edging	.01
Shelling front	.01
Button holes, front	.0125
Button sew front	.0125
Crochet bottom	.0125
Total	.0925

Pants.

Sewing bands	.10
Sewing buttons	.01
Button holing	.01
Total	.12

Low-necked sleeveless gauze vests.

Seaming across shoulder straps	.008
Sewing edging	.03
Taping	.04
Crochet bottom	.01
Total	.088

It will be seen that while the prices vary a little on the vest, there is only .001 difference in the total cost. On the pants, however, there is a difference in the total cost of 1 1/2 cents per dozen, which is on the price for sewing bands. Lafayette.

Manufacturing Half Hose.

Editor Textile World Record:

We were extremely interested in your article on the cost of 200 needle half hose on page 683 of the March issue. We would like to ask the author of this article a few questions as follows:

Is not 11 cents rather high for dyeing one pound half hose? We would also like to know what part of the cost of the miscellaneous items is charged to selling expense? The total cost of these items is 49 1/2 cents. In this case would 15 cents cover the selling cost, leaving 34.5 for mill expenses? In figuring our cost we figure the cost in the warehouse and then add to it the cost of selling as we do not want to include selling cost in our inventory figures.

We understand of course that the cost of selling varies in different organizations, but what we would like to know is in these figures what is the actual mill expense and what is the selling expense? Jefferson (1071).

Eleven cents per pound is somewhat high for dyeing black. However in figuring costs I have always made it a practice to figure a little high, as I would rather have the actual cost price a little too high than too low. In a mill of a large capacity and which manufactures a great number of different styles it is a very difficult matter to figure the exact cost, as no matter how complete a cost system may seem there are always some items of costs which are sure to be overlooked. I have known managers to use their cost system as a basis for figuring their profits from month to month on actual goods sold and in such cases almost invariably the cost has been found too low and the expected profits failed to materialize when the regular invoice is taken at the end of the fiscal year. For this reason I have found it advisable to figure a little high.

In regard to actual cost of dyeing, will say that the cost will run from 6 to 11 cents per pound, according to facilities and capacity of dye house. The method of dyeing used will also have considerable to do with cost of same. Many of the larger companies have their own secret process of dyeing, and some of them have been able to reduce the cost to as low as $4.50 per hundred pounds. This, however, is an exception and is found to be impossible on the part of the small manufacturer owing to the fact that the large salaries demanded by dyers having their own secret process will increase rather than decrease the actual cost in a mill of small capacity.

As regards the cost of selling, this depends largely upon the method used for disposing of goods. Some manufacturers have no regular salesmen, disposing of their goods direct to jobbers. Others depend largely on advertising and selling direct by mail order system, while others sell direct to the trade. In the article in the March issue I figured the cost of selling at 10 per cent. of the selling price. At the present time we are manufacturing goods similar to the class of goods you are seeking information on, and the actual cost price of same is $1.37. The selling price being $2.10. We figure our selling cost at 10 per cent., or 21 cents per dozen on this class of goods, thus leaving 28 1/2 cents as mill expense.

Merrill.

Richelieu Cloth.

Editor Textile World Record:

Will you kindly inform us what Richelieu cloth is, sending a sample if possible?

Salem (1066).

The top part of the sample shown at Fig. 1 is a 2 by 2 Richelieu cloth, but one of the courses is made with a different length of stitch from that in the others. This sample was made on a 6-feed machine. The bottom part is a basket pattern as follows:

Three courses tuck stitch 2 by 2 rib.

Three courses rib stitch 2 by 2.

A white yarn was used for the 3 courses of tuck rib stitches and for the first 2 by 2 rib course, following the 3 tuck courses, and an Egyptian yarn for the other 2 courses of 2 by 2 rib. The left side of the sample shown at Fig. 2 is a 2 by 2 Richelieu rib and the other a 5 by 2 Richelieu rib. The Wildman Manufacturing Co. informs me this cloth was made on a 15-inch machine, 12 needles to the inch, using a single 20s

Egyptian cotton. All these combinations of Richelieu rib are used for ladies' underwear, combination suits and ordinary vests and drawers. Lafayette.

The loss or shrinkage in the dyeing of carded peeler in Egyptian stain, or in fact any of the prevailing shades on knit goods that are dyed mostly with a direct color

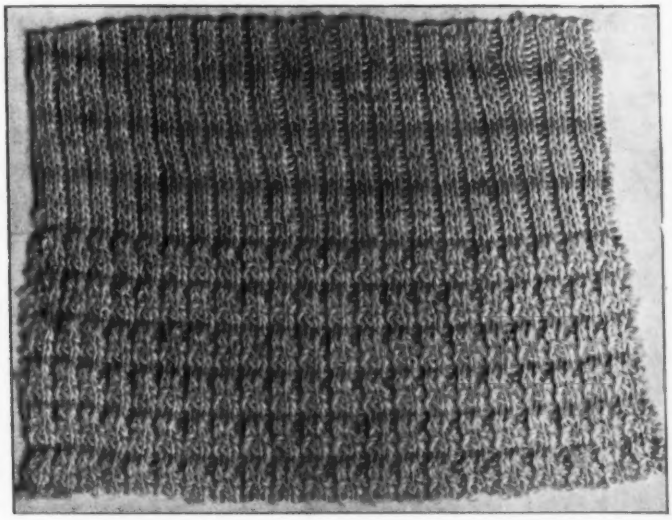


FIG. 1.

Gain or Loss in Carded Peeler Yarn.

Editor Textile World Record:

After knitting a roll of carded peeler yarn on the spring-needle machine and then sending it to a dyehouse to be stained Egyptian, would there be any loss or gain in the weight of the roll, and if so, what percentage? Stanley (1065).

process, will be approximately 3 per cent. If it is necessary to first bleach the goods to obtain the required clearness or brightness of shade the loss in weight will be 2 per cent. more, or a total shrinkage of 5 per cent. Morocco.

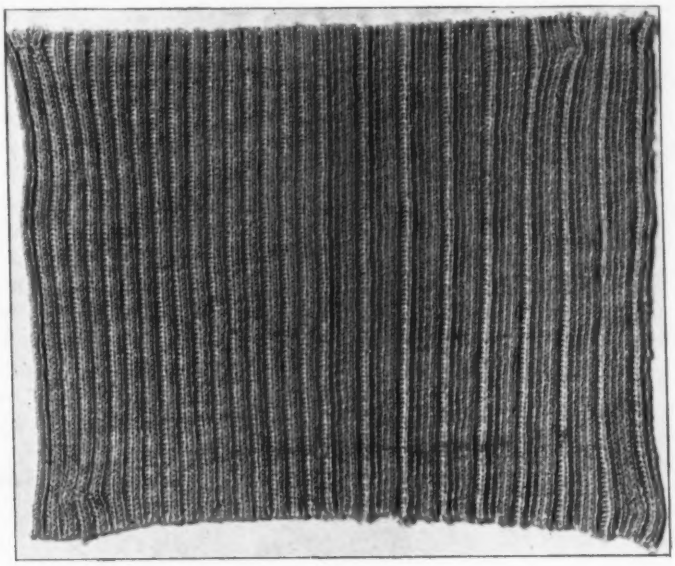


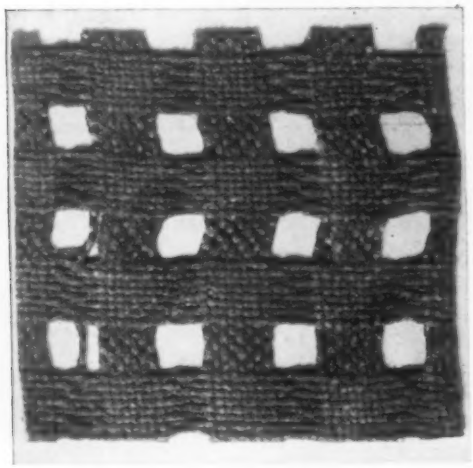
FIG. 2.

Manufacturer of Webbing.

Editor Textile World Record:

Have you the address of a manufacturer from whom we could obtain a woven fabric like sample enclosed, without the gum covering into which this material was dipped? Power (1070).

The sample shown in the illustration is a cotton fabric. If any of our readers are in-



terested in this inquiry we would be glad to forward their address to "Power."

Cost of Dyestuffs.

Editor Textile World Record:

What do English dyers have to pay for the leading chemicals and dye-wares? Tinctor (1072).

The following prices are abstracted from a commission dyers' books (March, '09). He buys in good quantities and carefully and his figures are representative of the general trade.

Bleaching powder, 100 lbs.	$1.25
Copperas, 100 lbs.	.56
Sulphuric D O V, 2,000 lbs.	15.16
Acetic, 60%, 100 lbs.	3.56
Formic, 90%, 100 lbs.	8.60
Caustic Soda, 90° Tw., 2,000 lbs.	22.05
Myrabolam extract, 100 lbs.	1.50
Madder, 100 lbs.	11.12
Cudbear and Camwood, per lb.	.09
Wood, 2,000 lbs.	71.35
Tartar emetic, per lb.	.25
Gambier, per lb.	.08
Soda, 100 lbs.	.76
Logwood chips and raspings, 2,000 lbs.	27.67
Indigo natural, 60%, per lb.	.60 to .64
Hematine crystal D W, "Alligator,"	.11

Prices of the coal tar colors are in all cases per pound. Some of the most commonly used are these.

Diamond Black F (several makers.	$0.22
Napthylamine Black B K (By)	.12½
Benzo Fast Black	.40
Synthetic Indigo (19% to 20%)	.18
Alizarin Red (20%)	.15½
Azo Rubin	.19
Methylene Blue	.52
Anthracene Brown	.16
Alizarin Blue S W	.87
Coomassie Blue	.35
Coomassie Prune	.42
Beta Naphthol	.16½
Diamine Scarlet H G	.54
Diamine Dark Blue B	.37½
Diamine Catechine R	.37½
Lanacyl Blue	.50
Lanacyl Violet	.40

If averages are of any interest to Tinctor he can be told that most tar colors used in England are imported and that the average value per pound of the imports for last year was 22 cents. Romulus.

"Double Spun" Cotton.

Editor Textile World Record:

What is the meaning of "Double Spun" on the labels of some cotton yarn that I have seen imported? Spinner (1073).

In Lancashire the words usually imply that the yarn has been rereeled and picked after spinning. There are commission firms specially equipped for the work who charge 2 to 4 cents a pound for removing all bad ends, snarls, etc., and putting good yarn into perfect condition. Egyptus.

The total number of wool shipped from Uruguay from October 1 to September 30, 1908, was 95,401 bales, as compared with 82,405 bales and 75,792 bales for the two preceding seasons.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 236 to 253. Also Buyers' Index.

THE KNIT GOODS SITUATION.

There has been but little change in the conditions governing the knit underwear end during the past month and taken as a whole, it has been a quiet period. Jobbers report that all their salesmen have been on the road since February first, soliciting fall orders and that while they have secured business equal to that taken up to this time last year, it is, of course, far from satisfactory. By looking over the orders placed by retailers so far, it is found that they are nearly all for cotton goods and for ribbed fabrics in particular and travelers say it is a very difficult matter to get the attention of buyers on any wool lines either for men, women or children.

A fair business has been taken on men's fleeces and the indications are that during the past month they have regained some of the ground lost to the 12-pound ribbed goods. The reduction in the price of fleeces, of course, accounts for some of this and it is now possible for jobbers to buy a No. 1 standard weight goods as low as $3.37 1/2, which brings them practically the same price as the ribbed garments.

We learn from some sources that men's worsted union suits are being sold very freely and it is claimed by many that they are taking the place of men's flat wool shirts and drawers to quite an extent. Certain it is there are many manufacturers of men's flat wool goods who are short of orders and are in a position to promise early deliveries on any orders that they can secure.

The Rockwood Co. of Bennington, Vt., are putting on the market a line of men's wool shirts and drawers which they have branded "Anti-Tuberculosis" underwear. This is claimed to be made from strictly unadulterated grey wool, put up in heavy white boxes and sealed in wax paper with a red cross on the label, giving it the appearance of having come from a drug store. They are to be sold at $2.50 per garment and are to be advertised in the newspapers in all the larger cities from Boston to San Francisco.

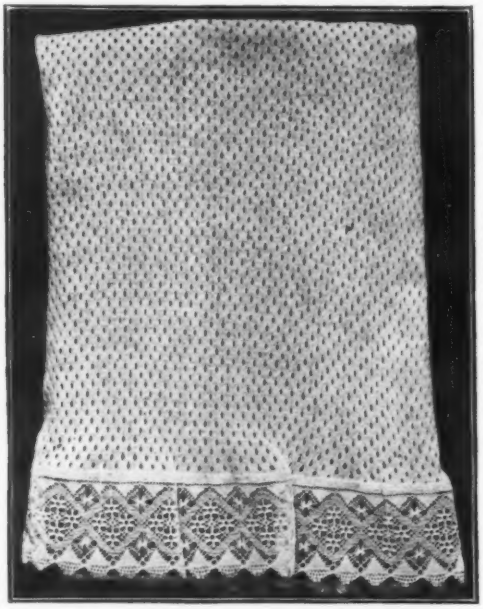
Another manufacturing concern who will advertise their production is the High Rock Knitting Mills, who will endeavor during the coming fall to create a demand by the consumer for their line of 50c. fleeced shirts and drawers. These goods are sold to the jobbers at $3.50, $3.65 and $3.75, according to the weight, running from 13 pounds to 14 pounds on size 42.

THE "KEEPKOOL" UNDERVEST.

The Fuld & Hatch Knitting Co. have also started an advertising campaign to set forth the merits of their line of ribbed underwear knit with eyelets, very similar to those in the Porous knit goods, and are branded "Keepkool." These get to the retail for 50c. for separate garments and $1.00 for combination suits, and will no doubt be in good

demand, especially during the hot weather period. We illustrate in this issue one of the ladies' sleeveless vests with fancy yoke and also a pair of lace trimmed pants of the "Keepkool" line.

Jobbers are complaining in regard to the poor deliveries they are receiving from some manufacturers of summer goods and claim that orders that should have been filled in February are still on their books. This applies more especially to ladies' shaped ribbed goods in the neighborhood of $1.75,



THE "KEEPKOOL" LACE TRIMMED PANTS.

and to a few lines of straight ribbed vests that were spoken of in some of our fall issues as being such exceptional values, and as well, a line of torchon lace trimmed pants sold to jobbers at $1.65 to $1.75. Of course, these manufacturers have different excuses to offer, such as low water, lack of help, inability to get fancy trimmings, etc., but it is very annoying to jobbers who place their orders in the month of June and July and are now obliged to look up other lines to take the place of these.

There is a very noticeable increase in the demand from retailers for ladies' combination suits in summer fabrics. The market is bare of this class of goods and several manufacturers are taking orders only for June delivery. They state the call is almost entirely for low neck, sleeveless garments and that their finishing departments are not equipped to take care of the extra quantity of this class of work.

Men's balbriggans are fairly active; nevertheless, manufacturers are well up on their orders for both 25c. and 50c. grades and duplicate orders have been filled quite promptly during the past month.

Nainsook and muslin shirts and drawers and combination suits for men have sold largely and some of the better manufacturers are now asking from four to six weeks' time to execute duplicate orders on these lines.

Some talk of showing samples for spring, 1910, is heard among the manufacturers and agents, but it is believed that it will be nearly the first of June before any real efforts are made to secure business. While the road men will probably make a trip during the month of June, the matter of placing definite orders of any volume will probably be delayed until after the first of July, when the buyers come East. It is now planned to hold the meeting and banquet of knit goods buyers about July 6th and the chances are it will be during the first two weeks of July when the bulk of the spring business is placed.

HOSIERY.

Plain colors still occupy the center of the stage in the hosiery industry. They have served as a means of injecting life into what would otherwise have been a rather dull season. There has been and is a scarcity of orders among the jobbing trade for immediate delivery on staple blacks, but the general report on the volume of business placed for fall delivery is much more encouraging and retailers are placing their orders quite freely.

These orders have been principally on goods of domestic manufacture, as jobbers and importers have not been willing to accept orders for foreign goods, except under

the heading of "subject to tariff revision." On account of this tariff revision, some importers did not make any special prices for import orders for fall delivery and have been booking such orders as have been given to them at stock prices without promise of a later reduction in case change is made in the tariff schedule. Others have taken the orders at stock prices with the understanding that their goods will be billed at the usual import prices made by them in the event of the Dingley Bill remaining in force as regards hosiery.

The wildest excitement has prevailed in Germany over the proposed new hosiery rates. This was natural, inasmuch as it meant the practical destruction of their trade with this country on goods to retail at 25c. and sold through importers and jobbers. German manufacturers, dyers and finishers have been working overtime in their mad rush to complete and ship all orders to this country as quickly as possible, and the Hamburg Line augmented their service by the addition of one steamer each week.

There has been a large number of American buyers in Chemnitz buying up stock lots of anything that was desirable and that could be shipped quickly. As a consequence, stocks are well used up and not much of anything left that is desirable. The 36 to 42 gauge goods are entirely sold and what is left to sell are 33 gauge.

During this rush, lace hosiery was bought very freely and there are very few stock lots left to buy. The one thing of which there are big stocks on hand and which were not bought, are men's split foot half hose, especially those costing from M3/20 to M4/—.

The three or four-inch welt for ladies' hosiery is gaining immensely in popularity and it now looks as if all but the heavier weights will soon be made in this way. It is something that appeals strongly to the consumer and has the added virtue of being practical and an improvement on the old garter splicing.

Trunk tops and linen spliced heels and toes are also featured by both domestic and foreign makers and are seemingly gaining in popularity.

The failure of manufacturers to deliver their goods on time and the consequent failure of jobbers to do the same is being given by many retailers as a reason for not placing their advance fall orders, and is also responsible for the lack of duplicate business on spring goods.

The darker shades promise to be popular for the fall and the prediction of the most popular shades for fall by dress goods people include,—taupe, old rose, raspberry, catawba, wisteria, peacock, olive, Havana brown (medium), cardinal, Burgundy, navy, amethyst.

In another month it will be possible to make a more intelligent statement, as many orders will then have been placed by retailers. The latest and most popular shade now is bronze and is in very big demand.

DOUBLE SCREW POWER PRESS FOR HOT PRESSING.

A proper and permanent finish is essential to insure ready sale even of the best made hosiery. No matter how good yarn is employed or how well the goods may be knit, the buyer's impressions are unfavorable if the finish is not first class, and on the pressing depends this important result.

Whether the hot finish or cold finish is the best depends largely upon the character of the goods. In many cases the hot finish is the one which gives the best results.

This is obtained by first pressing between hollow plates heated by steam, which prevents scorching the goods, and afterwards cooling them quickly by circulating cold water through hollow plates.

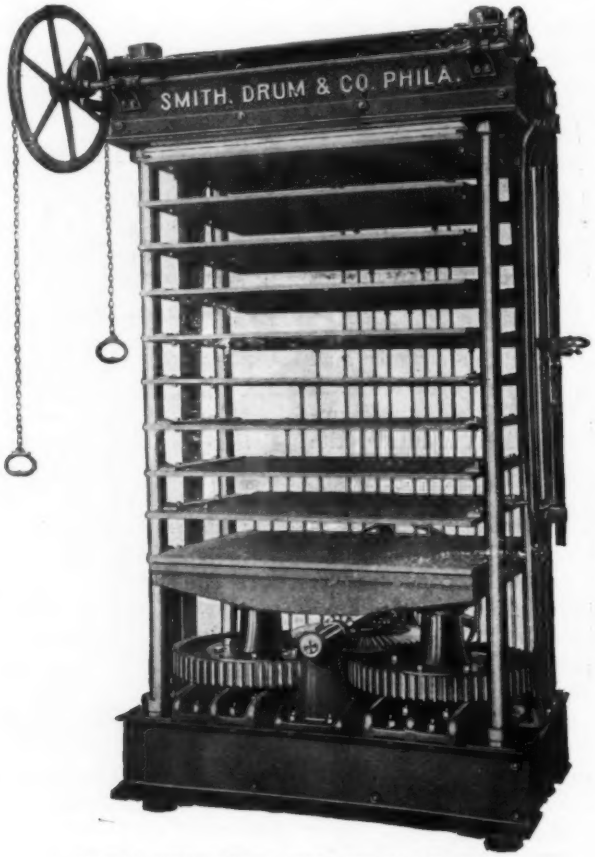
The best effects are obtained in this way. The goods retain the excellent results by the hot and cold pressing. Should the goods when hot be taken from the press and exposed to the atmosphere they do not retain the same finish.

The illustration shows one of the latest style hot presses built by Smith, Drum & Co., Coral and Cumberland Sts., Philadelphia, Pa. The head plate and the bed plate of this press are now made of steel "I" beam construction. Formerly it had been the custom to make these parts of heavy cast

iron castings. The steel "I" beams are of uniform section and strength, not subject to blow holes and shrinkage strains as cast iron, and have been found much superior to cast iron. They will not crack or break from over heating, or from the sudden heating or cooling of the goods.

reduce the end thrusts of the screws to a minimum.

The machine is self contained and does not require a floor stand or any other support for end of shaft—a feature which saves considerable labor in erecting, also which always insures the perfect alignment of the



DOUBLE SCREW POWER PRESS FOR HOT PRESSING.

The platen or press table is operated by two screws of large diameter. In transmitting the power to the double screws, bevel gears and spur gears are used. Repeated tests have convinced the builders of the superiority of the spur gear drive over the worm gear drive. They found that 90 to 95 per cent. of the power delivered to the machine having a spur gear drive is actually transmitted, whereas only 20 to 30 per cent. efficiency is obtained by worm gear drive. Anti-friction discs of steel are also used to shaft and bearings. With the press is also furnished a countershaft, tight and loose and driving pulley, hangers and belt shifter complete.

The press is built complete and set up in the shop before shipping to insure everything being perfect. All parts are then carefully marked before press is taken apart, so that with the aid of a competent mechanic it can be readily erected in accordance with the instructions furnished.

The press is especially designed to with-

stand heavy and continuous service; all wearing surfaces have been made extra large and ample means of lubrication have been provided. The bevel gears are cut so when machine is running it is practically noiseless. The builders forge their own hollow plates which are tested with water and steam before leaving the works. Plates have solid bosses forged on them to receive pipes from manifold, which they consider a much better method than having a casting bolted to same to make water and steam connection. The stuffing boxes have extra long bearings to allow for plenty of packing in order that the glands on the stuffing boxes need not be tightened excessively in order to withstand the pressure. The object of this is it does not put undue pressure on pipes, and prevents breaking of same on the manifold.

For other classes of work when hot pressing is not desirable, Messrs. Smith, Drum & Co. build other styles for cold presses.

In the year ending June, 1899, we sold 3,773,000,000 pounds of cotton to foreign countries and received $209,600,000 or 5 1/2 cents a pound for it. In the year ending June, 1908, we exported practically the same amount, to be exact, 3,816,000,000 pounds, and received $437,700,000, or 11 1/2 cents a pound for it.

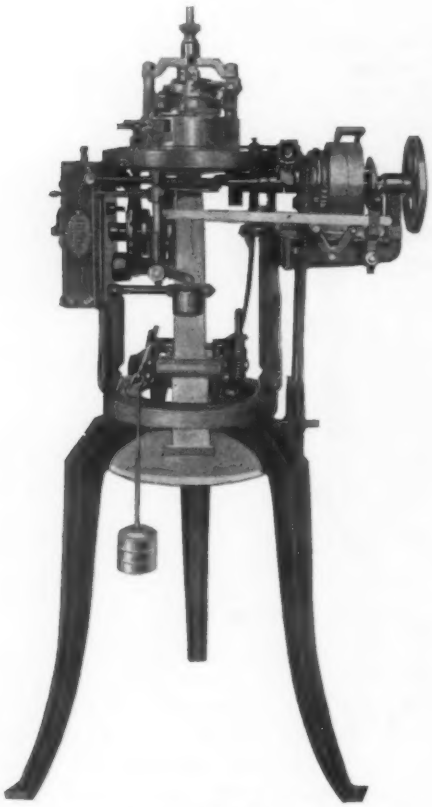
TWO NEW CLIMAX ATTACHMENTS.

The Climax Machine Co., 1753 North Howard St., Philadelphia, have recently perfected and are now bringing to the attention of manufacturers two new attachments which have not been previously described. The first is applicable to flat knitting machines, and as shown in the illustration changes a hand power flat machine to power driven. It has automatic takeup and racking, all of which are constructed on an iron stand, which is made all ready to receive the knitting machine, bolts being provided for securing it; any make of flat knitting machines will fit the attachment. With this improvement it is claimed the operator can make any kind of fancy racking, as it will automatically rack every half round, every round or every other round, at the option of the operator. There is a device to rack one, two or three needles either forward or backward. The takeup of the attachment dispenses with changing weights and automatically equalizes the tension on the web. With this automatic device the machine may not only be driven faster, but one operator can run several machines instead of one.

THE CLIMAX ATTACHMENT FOR FLAT KNITTING MACHINES.

The other attachment is an improved device for circular rib knitting machines. Several months ago we illustrated their first device for this purpose, but this has been

so changed and modified that the improved attachment is deserving of special notice. In knitting welts and loose courses the machine is run at standard speed, but after and between the welt and loose course, the attachment by means of an improved principle of belt shift, automatically increases the speed. It is stated that there is no lost motion as the action is positive. In addition to



THE CLIMAX ATTACHMENT TOR CIRCULAR RIB KNITTING MACHINES.

increased output of the machine, which is placed at from 30 to 60 per cent., there is also claimed to be a saving of very considerable percentage of waste. The attachment is applicable to any machine without moving it from its position and requires no special skilled help to apply it.

Their new devices are practically demonstrated at the National Hosiery and Underwear Exhibition at Philadelphia during the week of May 11th to 15th.

A NEW VERTICAL SPINDLE BOBBIN WINDER.

This is a new machine recently added to the list of machinery manufactured by the Textile Machine Works, Reading, Pa., and we believe that it deserves the attention of the hosiery and knitting trade on account of the excellent qualities it possesses.

The machine is specially designed for winding fine yarns in lisle and mercerized

SAMPLE OF WORK DONE ON NEW VERTICAL BOBBIN WINDER.

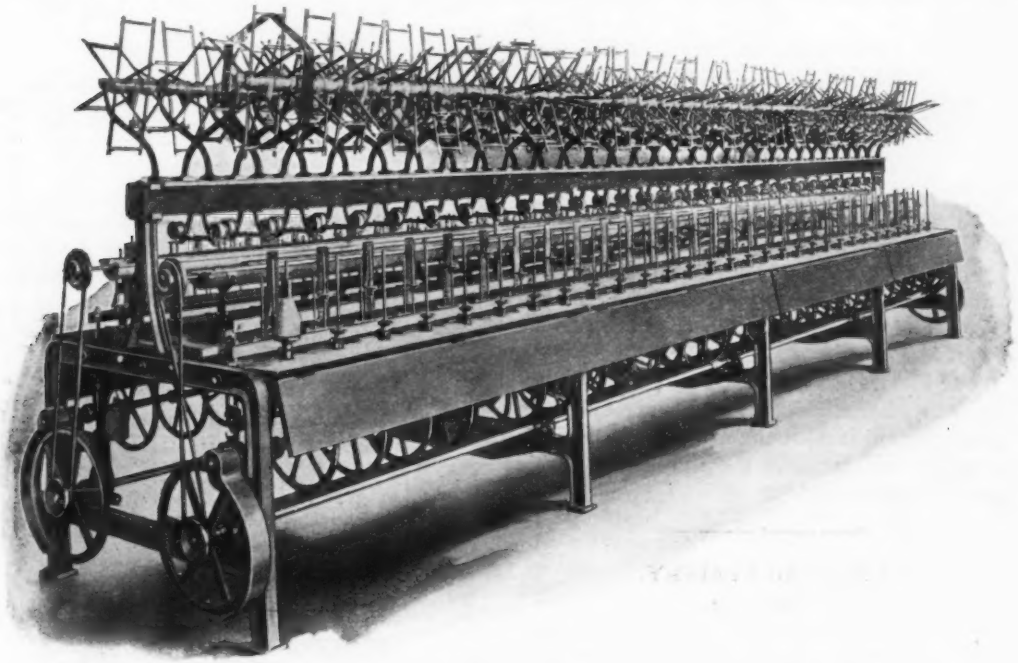
cotton. Its working principles are the same as those employed in the highest type of European winders of which many have been imported during recent years, because the average type of winders furnished by manufacturers in this country was not satisfactory for fine yarns and high grade work. The builders of this machine claim for it that it embodies all the best principles of a high grade bobbin winder and that in design, careful selection of materials and best work-

manship it stands first and foremost. They guarantee it for durability and quality and quantity of output.

This winder is generally built with 64 spindles, 32 on a side. These spindles are driven by means of a variable speed friction disc drive, resulting in maintaining a uniform speed during the winding operation.

Inasmuch as the yarn speed is the direct product of the diameter or circumference of the bobbin and the number of revolutions of the spindle, it follows that the yarn speed must remain constant when both are reversely increased or reduced.

Some of the winding machines on the market are built on similar principles, but as



THE NEW VERTICAL SPINDLE BOBBIN WINDER BUILT BY THE TEXTILE MACHINE WORKS, SHOWN IN OPERATION AT THE KNIT GOODS CONVENTION IN PHILADELPHIA.

When the diameter of the bobbins is largest, the rotating speed of the spindle is smallest and vice versa. The main driving shaft has imparted to it an oscillating motion which causes all the driving pulleys to shift uniformly the point of contact on the spindle driving disc to a distance more or less removed from the center of the disc. The variable rotating speed of the spindle resulting from this corresponds with the motion of the yarn guide. The latter is at the lowest point on the cam when the driving pulley is on the point farthest away from the center of the spindle driving disc, and when the yarn guide is at the highest point the driving pulley is nearest to the center.

they are chiefly intended for coarse yarns they are not adapted for high grade work such as the fine numbers of lisle and mercerized yarns. The chief claims for this machine are superior workmanship, easy and uniform running, permitting the winding of the finest yarn and the making of perfect spools.

Where it is desired the machines are provided with a wet spooling attachment, consisting of a trough filled with a soap solution in which a cylinder revolves and which moistens and lubricates the yarn. An adjustable tension is also provided which can be regulated according to the strength of the yarn.

One of the main features on this machine is the traverse motion which rides on the well known type of cams. These cams are carefully milled and the motion is thoroughly well supported and perfectly balanced in such a way that when the traverse on one side of the machine goes up it goes down on the other side, thereby saving power and eliminating all unnecessary pulling and jerking on the yarn. The machine is furnished to wind either from skeins, cones or cops and its perfect construction results in a high quantity and quality of the bobbins wound per day.

The machine is furnished for either belt or motor drive. It requires a floor space 23 ft., 2 in. long by 4 ft., 2 in. wide, and is 6 ft., 5 in. high. Its weight is approximately three thousand pounds. When winding from cones the maximum diameter of the cones is 8 in. and the maximum diameter of the spool is 4 1/4 in.

The illustration of the spool is from a photograph of work done on the machine and gives a good idea of the quality of the work to those familiar with the operation of this class of machinery.

KNITTING HOSIERY.

BY RARITAN.

During my somewhat extensive experience in the manufacture of hosiery I have collected data on the sizes of the machines to use for different classes of work, including the gauge of the needles, size of yarn, weight of goods and piece work prices:

Misses' or boys' 1 by 1 ribbed leg, plain foot, weight 1 1/2 pounds a dozen for size 7 1/2 inch, sizes 5 to 9 1/2 inches.

Yarn for legs—2/34s combed Egyptian cotton.

Yarn for feet—1/14s combed Egyptian cotton.

Needles for cylinder of ribbers, 36 gauge with a 42g. hook.

Needles for dial of ribbers, 48 gauge.

Needles for footers, 42 gauge.

Sizes of machines for legs:

Diameter of cylinder.	No. of needles.	Size of stocking.
3 3/4 inches	96	5 – 5 1/2 inches
4 "	108	6 – 6 1/2 "
4 1/4 "	120	7 – 7 1/2 "
4 1/2 "	132	8 – 8 1/2 "
4 3/4 "	144	9 – 9 1/2 "

The number of needles given above are for the cylinder only. As the rib is 1 by 1, the dials will have the same number of needles also.

Sizes of machines for feet:

Diameter of cylinder	No. of needles.	Size of stocking.
2 2/1 inches	96	5 – 5 1/2 inches
2 3/4 "	108	6 – 6 1/2 "
3 "	120	7 – 7 1/2 "
3 1/4 "	132	8 – 8 1/2 "
3 1/2 "	144	9 – 9 1/2 "

As the footers have the same number of needles as the cylinders of ribbers, in transferring the stitches of the ribbed legs to the footers, two stitches will be required to go over each needle.

APPROXIMATE PIECE WORK PRICES ON ABOVE:

Knitting legs	.03c	per dozen
Knitting feet, (including transferring of legs)	.18c	"
Looping	.0475	"
Mending	.03c	"
Dyeing (black)	.07c	"
Finishing, which includes boarding, drying, inspecting, folding and boxing.	.07c	"
Boxes, (2) for 1 dozen	.04c	"
Cases and shipping	.015c	"

MARKING KNIT GOODS.

Editor Textile World Record:

I have read with interest the question and answer regarding the marking of knit goods which appeared in the April issue. You have given a good formula for marking goods so that the marks will stand the bleach. I have always instructed knit goods manufacturers in this locality to use coal tar, as that is the only material that will stand the bleaching process. "Dulcimer" recommends the use of wood blocks for stamping the letters or figures. These blocks are good as far as they go, but I have made the stamps of brass for years. They can be made either solid or with the letters adjustable by a thumb screw. The tar does not have any effect on the metal, which will last three times

as long as wood. This is merely my experience. I have been in the business only forty years. A. M. Michael.

KNITTING PLATED FABRICS.

A device for knitting machines designed to facilitate the production of plated work has recently been patented in this country and is described by the inventor as follows:

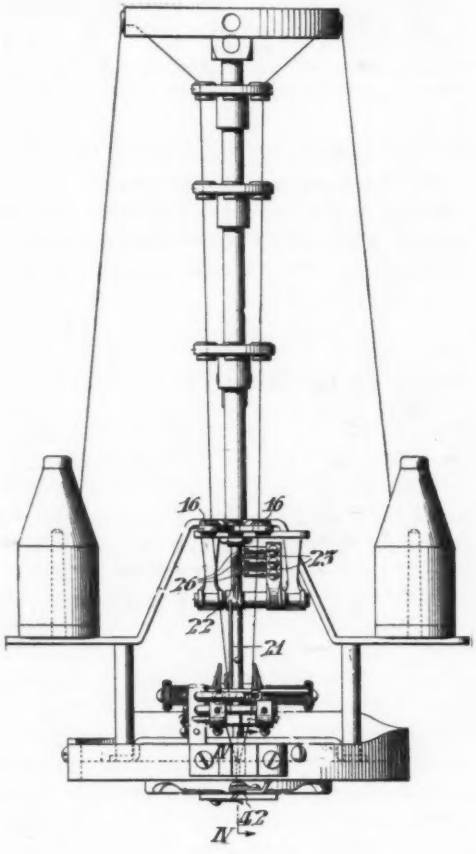


FIG. 1.

The term "plating" is used to denote a method of knitting by which two yarns are simultaneously fed to and knit by the needles, with provision whereby the relation of the yarns to each other as they pass into the knitting operation is such that a certain yarn will be visible upon the face of the fabric while the other yarn will be knit upon the back. In this way a knit fabric may be produced having uniformly a yarn of one color for its face, and a yarn of another color for its back. It is common in plating devices to provide means by which at intervals, the two yarns may be so manipulated as to invert the position of the yarns in knitting. By thus employing yarns of different color and changing their relation to the knitting at intervals various patterns may be produced.

Difficulty is often experienced in maintaining the proper relative position of the two yarns under the varying conditions of the knitting process. The yarn which forms the back of the fabric is called the body yarn, and that which goes to the face of the fabric is called the plating yarn, and in the ordinary knitting machines plating is usually accomplished by so feeding the yarns that the plating yarn passes into the hook of the needle simultaneously with but underneath the body yarn.

By reason of there being no room for special manipulation of the yarns between the yarn guide through which both yarns pass and the needles, it frequently occurs in practice that the two yarns will reverse their positions, throwing the wrong yarn to the face of the fabric and producing flaws in the work. This reversal of the yarns is usually due to accidental, but almost inevitable, changes of tension. For example yarn will occasionally catch as it reels off a bobbin; and there is a difference between the tension with which the yarn reels off a new bobbin and off one partially unreeled. These and many other unavoidable causes well known to knitters result in variations of the tension of the yarns, and notwithstanding the use of delicately adjusted tension arms, and the other well known devices, these accidental variations of tension are sufficient to frequently cause the plating operation to be defective.

This invention is designed to overcome this difficulty, and to maintain constant the relation of the threads during the knitting operation and their proper relative tensions. The proper relation of the plating yarn and body yarn may be maintained, not only during ordinary circular or full knitting, but during what is known as reciprocatory knit-

ting. It is a common feature in all stocking knitters, and in some other forms of circular knitting machines, that the machine after knitting a continuous tube by rotation of the parts, ceases temporarily to operate and proceeds to knit for a time by a motion of reciprocation of the same parts, the most

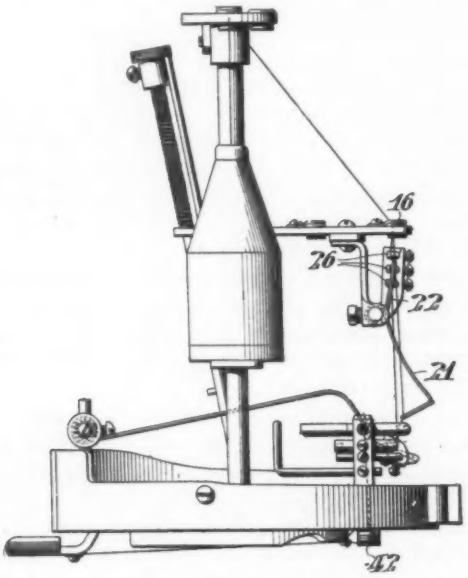


FIG. 2.

common instance of this being the formation of the heel and toe pockets in the knitting of stockings.

In the ordinary stocking knitter it has hitherto been found impossible to maintain the relative position of two yarns so that they will be fed in the same relation to the nedles when the machine is reciprocating, because at the end of each stroke the reversal of the motion tends to invert the position of the threads. This difficulty is overcome by the device under consideration, and the cloth is plated as accurately during reciprocatory knitting as during rotary knitting. In this way it is possible to knit an entire stocking including the heel and toe pockets of two yarns, constantly maintaining one thread upon the face of the fabric and another thread upon the back.

Fig. 1 is an elevation of a rotating latch guard with its thread guide and supports. Fig. 2 is an elevation of the lower half of the same parts as shown in Fig. 1, but viewed from a point at right angles to that from which Fig. 1 is taken. Fig. 3 is a detailed view partly in section showing that portion of the latch guard which carries the main yarn guide. Fig. 4 is a section taken along the line, IV, IV, in Figs. 1 and 3.

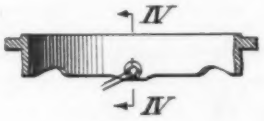


FIG. 3.

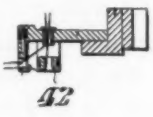


FIG. 4.

The more important portions of the device are the tension equalizer and the lower yarn eye. The latter maintains a separation of the yarns as they pass through the yarn guide. The tension equalizer operates by the coaction of the tension arm, and the alternating fingers.

The bobbin carries the body yarn which, after passing through successive yarn eyes carried by the collars on the post, runs through an eye of plate and then passes through the terminal loop of the tension arm. Thence it passes through the ordinary tension device, back over a block, down through its eye, through a tension eye, and thence through another eye, whence it is led directly to the main yarn guide, assuming a position near the top. The plating yarn, which is to be knit on the face of the fabric, is led from a bobbin through a succession of eyes as above, but, after passing through the eye, 16, it runs between the fingers on one side and fingers on the other. Thence it passes down through the tension device in precisely a similar manner to the other thread, and passes down with the other thread through an eye, but instead of passing directly to the yarn guide, it is led through a supplemental eye, 42, and thereby caused to assume a lower position in the guide than the other thread, as more clearly appears in Fig. 4. The operation of this tension equalizer depends upon the relative position of the tension arm, 21, and the finger arm, 22. This must be adjusted so that yarn, when running under the normal tension, will be drawn by arm, 21, slightly

out of its vertical run, with the result that the fingers, 23, on the finger arm, 22, are in such relation to the fixed fingers, 26, that the thread, as it passes between them, is subjected to but slight friction. The moment that a slight increase of tension on yarn draws in the arm, 21, there is a change in the position of the fingers.

In plating it is ordinarily necessary that the body yarn be subjected to a greater tension than the plating yarn, this tension tending to hold the body yarn in the uppermost position as it passes to the needles. But it is equally essential that any substantial increase in the tension of the body yarn should be accompanied by a corresponding increase in the tension of the plating yarn, and this is the function which this device is said to accomplish. The adjustment between the parts is such that any increase in the tension of the body yarn causing it to run more vertically out of the eye, 16, draws in the tension arm, 21, towards the center line of the machine and simultaneously, throws the fingers, 23, forward so as to require the plating yarn to intertwine more deeply between the fingers, 23, and the fingers, 26, instantly placing upon the plating yarn the required increase of tension. The devices are very delicate in their operation and by means of them the slightest increased tension upon one yarn is immediately communicated to the other, so that the relative tension between the two yarns is always maintained constant irrespective of their absolute tensions. This is the important element in the successful practice of the plating operation.

KNITTING MILL NEWS.

New Mills.

Michigan, Grand Rapids. The Sanitary Knitting Co. has been incorporated with capital stock of $15,000. E. A. Clements has been elected president; Carl A. Clements, vice president; and E. C. Mangold, secretary and treasurer. Machinery is being installed in the Raniville Bldg. on Lyon St., and manufacturing will be started soon. Mr. E. A. Clements is president of the Globe Knitting Works.

*Mississippi, Meridian. Contract for 100 knitting machines and electrical power equipment for the new Pricilla Mills have been awarded. Construction work was started two weeks ago, and it is planned to begin manufacturing with initial equipment of 100 knitting machines and 5 sewing machines about July 1. Seamless fine gauge hosiery will be the sole product. As reported previously, the capital stock is $30,000. A. W. McLellan is president; W. H. McLellan of the Alden Mills, New Orleans, Louisiana, is agent and buyer; Oswald Moers is superintendent. In addition to the equipment given above there will be a dye house for piece dyeing.

New Jersey, Plainfield. Rosenthal Bros., importers and converters of silks, with offices at 463 Broome St., New York, have secured a building on Washington Ave., formerly occupied by V. Perrin et Cie, and will install 50 looms.

*New Jersey, Woodbine. The new Coast Knitting Co. will occupy the building formerly used by the Quaker City Knitting Co., now located in Philadelphia. They will manufacture sweaters as previously reported. Their New York office will be at 11 West 18th St. Other particulars of this enterprise have been given.

New York, Hornell. No details have been arranged relating to the proposed new silk hosiery company in which F. P. Merrill, treasurer and superintendent of the Merrill Silk Co., is interested. Representatives of local banks have agreed to take $25,000 of the proposed $150,000 capital stock.

*North Carolina, Chapel Hill. W. A. Ellington, previously reported as establishing a knitting plant with 27 knitting machines, will manufacture men's half hose and expects to begin manufacturing about April 15. A gasoline engine will be installed to supply power. Mr. Ellington has engaged W. L. Horah as superintendent. They are interested in supplies.

*Ohio, Piqua. The Imperial Underwear Co., recently reported incorporated with capital stock of $50,000, will manufacture men's union suits and sell direct to the retail trade. C. B. Jamison, Piqua, is prominently interested.

North Carolina, Mt. Pleasant. C. F. and A. N. James of this place will establish a plant of 25 knitting machines for hosiery, to be operated under the name of the James Knitting Mill. Material for building has been purchased. The plant will be operated by steam power. A. N. James is secretary and treasurer of the D. W. Kindley Cotton Mills of this place.

Pennsylvania, Philadelphia. A charter will soon be applied for the F. Metz Company with a capital of $50,000. The company has secured quarters at 2d and Allegheny Ave., where they will install 20 looms on which they will manufacture silk ribbons, and sell through New York. The president of the company will be Frederick Metz, who will also act as treasurer and manager.

Pennsylvania, Royersford. The McKibben Hosiery Co., which secured a charter during August of last year, report that they have equipped a plant with 9 knitters, 6 ribbers, 1 sewing machine and 1 looper, on which they are manufacturing men's, women's and children's hosiery, buying 14s to 60s cotton yarn on cones. J. G. McKibben is the secretary, treasurer and general manager.

*South Carolina, Jonesville. A mill will probably be built later in the year for the new company being promoted by Buel B. Reid, although at present nothing is known definitely. Mr. Reid is superintendent of the Ashley Mfg. Co., manufacturers of hosiery at Newberry, South Carolina.

Wisconsin, Kenosha. The Kenosha Knitting Co. has been incorporated with capital stock of $10,000 by E. L. Shiepper, C. E. Skiller and G. H. Curtis. Mr. Skiller has been superintendent of the Chicago-Kenosha Hosiery Co.

Enlargements and Improvements.

*Georgia, Columbus. C. L. Perkins, president and buyer of the Perkins Hosiery Mills, has announced that the proposed enlargement will be made at once. They expect to have new machinery running by September 15.

*Georgia, Lafayette. Improvements to the Walker County Hosiery Mills will cost about $15,000; $7,000 or $8,000 for an addition, 50 by 80 ft., 2 stories high, with basement, and the balance for about 85 new knitting machines and other equipment. They manufacture 160-needle ladies' and men's hosiery. James B. Shattuck is president; W. L. Magill, vice president and manager; A. R. Fortune, secretary and treasurer; and H. S. Lovern, superintendent.

*Illinois, Chicago. Within a few days the Lorenz Knit Goods Mfg. Co., recently incorporated with capital stock of $50,000, will move into its new plant, now under construction at 602-8 Belmont Ave. Complete details of this enlargement have been given.

*Iowa, Des Moines. The Guaranty Hosiery Mills are now operating 67 knitting machines and propose to increase knitting machines and capacity of dyeing department.

Maine, Topsham. The Max-mar-lan Knitting Co., Inc., manufacturers of seamless hosiery, have leased better quarters than those originally occupied. New machinery has been ordered and will be in operation before May 1. C. L. Lancaster is president; H. Q. Mariner, secretary and treasurer, and C. B. Maxfield, superintendent.

*Michigan, Lansing. Improvements to the Michigan Knitting Co.'s plant have been completed, with the exception of some improvements to the dye house equipment. They have completed a 2 story addition, 36 by 48 ft., to their stock room, and added another story to their former warehouse. New machinery has been installed.

New York, Amsterdam. A. V. Morris & Sons, manufacturers of men's flat and ribbed underwear of woolen and merino, operating mills in this city, have given out the contract for the erection of another mill adjoining their No. 5 mill. The building will be 70 by 130 feet, of brick, four stories in height and fireproof throughout. This building, it is reported, will be equipped with machinery sufficient to double the capacity of their present spinning department and will enable them to increase their product to 2,500 dozens per day. The operation will be started at once.

New York, Fulton. A large 2-story addition to the Monarch Knitting Mills, Inc., has been completed, doubling the capacity of the plant. A bleaching department has also been added.

*North Carolina, High Point. Additional knitting machines are being installed in the High Point Hosiery Mill. The previously reported addition to the dye house is to take care of the increased production made on the additional knitting machines.

Pennsylvania, Philadelphia. The Park Hosiery Mills, of which Graupner & Sons are the proprietors, located at 3d and Bristol Sts., report that they have placed an order for 10 additional knitters, which will about fill up their building. They also state that their intention is, if further increases are to be made in their plant, to purchase land on which to erect a new and modern building.

Pennsylvania, Philadelphia. The Argo Knitting Mills have recently been incorporated under the laws of the State of Delaware. The capital stock is $25,000 and the incorporators are M. M. Adams and J. T. Paxton. This company will take over the plant now operated by the Vim Knitting Mills, owned by M. M. Adams and located at 2420 Waterloo St., where he is operating 14 knitters and 15 ribbers on children's ribbed hosiery. It is the intention of the new parties to remove to larger quarters and materially increase the size of the plant.

*Pennsylvania, Reading. About April 10 construction work will be started on the new 3-story mill for the Mount Penn Underwear Mill, Miller & Stondt, proprietors. The building occupied by this company at present has been leased by them. Upon the completion of the new building the equipment will be moved from the present quarters. They expect the new building to be completed about March 15.

*Tennessee, Rockwood. Within the next thirty days equipment will be installed in the enlargement to the dyeing department of the Rockwood Mills, which will give facilities for the dyeing of tans and colors in addition to the dyeing of blacks. The boarding department will be moved into the new dye house and will relieve the crowded condition of the finishing room.

Utah, Lehi. The James Kirkham Sons Co. has been incorporated with capital stock of $25,000 for the manufacture and sale of knit goods. This company recently purchased the Standard Knitting Co. and at that time it was stated that the company would operate plant under the style of the Lehi Knitting Works. They are making extensive improvements.

Utah, Logan. The Union Knitting Mills Co. has awarded contract for the erection of an additional building. This enlargement will cost between $7,000 and $8,000.

Mills Starting Up.

Illinois, Freeport. The local plant of the Rockford Mitten & Hosiery Co., which has been shut down for a number of months, has resumed manufacturing.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

A Traveler Magazine. The Draper Co., Hopedale, Mass., are placing on the market a convenient device in the form of a magazine or holder for ring travelers, an account of which is given in this issue.

Driving Yarn Reels. Stephen Cotton Co., Belfast, Ireland. An improved method of driving reels for flax and other yarns. The drive consists of a flat, circular, leather-covered disk which is brought into contact with the friction plate. It is stated that the slightest contact is sufficient to set the reel in motion and the tendency to side-thrust is entirely avoided.

Self Feed for Cards. Karl Eyssen, Weixdorf, Germany. A first breaker self feed in which the apron runs in an undulating path instead of straight from one roller to the other. A number of bars are fixed in front of the apron. It is claimed that rolling of the stock is prevented and a more uniform feed is obtained.

Finishing Machine. E. A. F. Duering, Berlin, Germany. A steam blowing machine for face finished goods. The apparatus is enclosed in a boiler within which the cloth passes from one roller through boiling water, then between squeeze rollers to another roll. It is claimed that a very high and durable luster is obtained.

Warp Comb. R. Kiessling, Elsterberg, Germany. An improved comb for spreading warps during the warping and beaming process. It is claimed that greater uniformity in the distribution of the threads across the warp is obtained than by the other combs.

Automatic Doffer. Hall & Stell, Parks Works, Keighley, England. An automatic doffing attachment for worsted spinning frames which is said to be giving good results in a number of English mills.

Cloth Scouring Machine. James Bailey, Bridge-Street Works, Slaithwaite, England, is putting on the market an improved cloth washer which embraces several novel features.

Oil Pump for Ring Spindles. Cook & Co., 18 Exchange St., Manchester, England. A pump for extracting oil from ring spindles which is said to be simple in construction and very serviceable.

Knitting Machine. The Harrison Patent Knitting Machine Co., Manchester, Englang, are placing on the market an improved circular knitting machine for producing undervests, jerseys, stockinette cloth, etc.

Gill Boxes. Leopold Offermann, Leipzig, Germany. An improved faller motion for gill boxes, a supplementary cam being provided to enlarge the working surface, thus prolonging the life of the faller.

Mule Spinning. Oscar Schimmel & Co., Chemnitz, Germany. An attachment for spinning mules to regulate the beginning of the outward movement of the carriage so that it may be properly timed with the delivery of the roving by the rollers.

Automatic Loom. Heinrich Zwicky, Schindellegi, Switzerland. A loom equipped with an automatic shuttle changing attachment which has been developed in one of the Swiss mills and is said to be giving very good results.

A Loom Swell. The Shaw Patent Appliance Co., 32 Church St., Padiham, England, are putting on the market a loom swell which is said to be very simple and durable. Twelve hundred looms are being equipped with it in the Julibee Mill, Padiham, England.

A GREAT ENGINEERING PROBLEM.

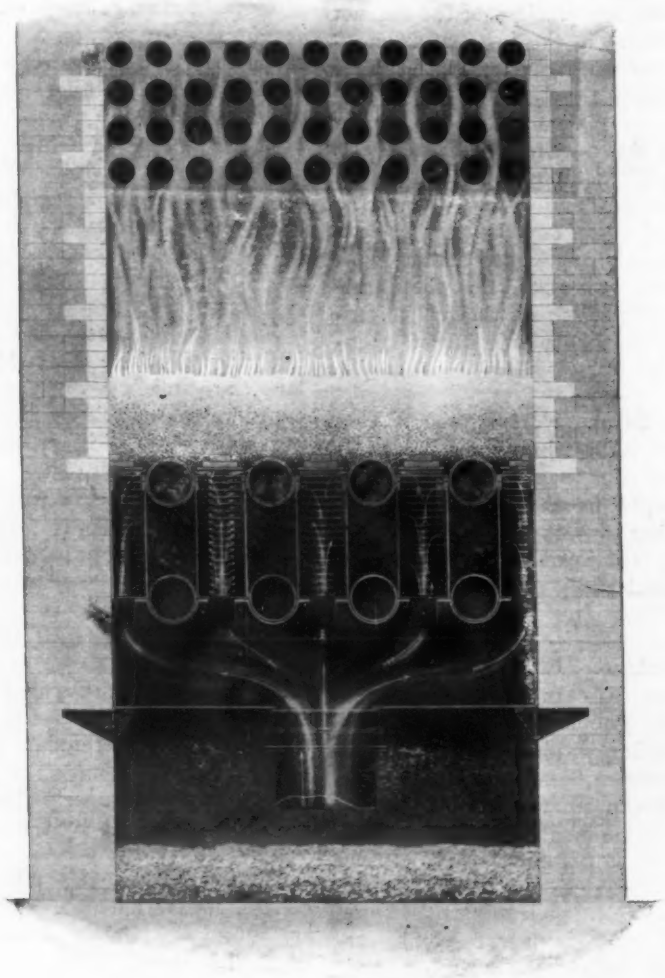
THE TAYLOR STOKER.

The American Ship Windlass Co., Providence, R. I.

Although neither complex nor difficult, the process of combustion is one of the most important problems of the day. That fuel is wasted to an extent that is entirely unwarranted is apparent to anyone who will compare thousands of ordinary or poor plants with a few of the best.

To what is the difference due? Not wholly to personnel, for many ordinary plants are cared for by men of experience and engineering ability. The cause of the waste, then, must be due to the apparatus.

In many boiler houses, too many in fact, hand firing is practiced, and while there are arguments that seem to prove hand firing superior to mechanical stoking, yet the latter method of furnace feeding has a few features that render it practically superior to hand firing.

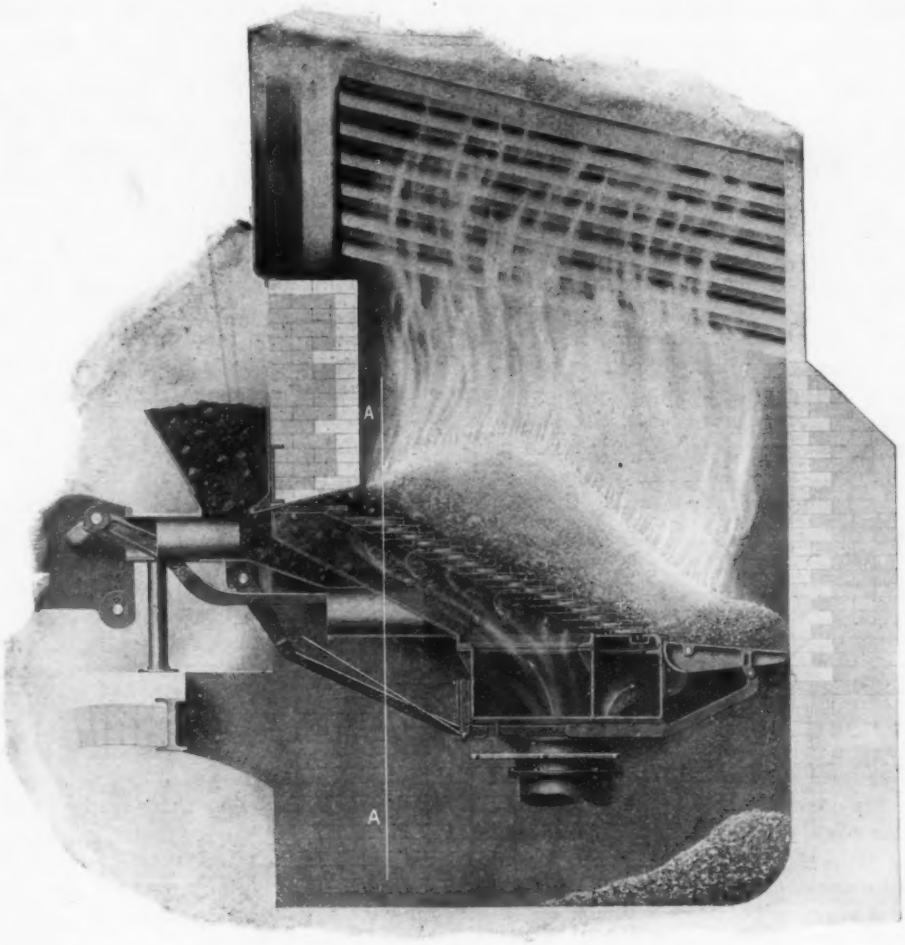


THE TAYLOR STOKER IN POSITION, SHOWING A CLEAN, EVEN FIRE ACROSS THE FURNACE.

With all methods of hand firing the door must be opened frequently allowing a rush of cold air into the furnace. While this air does mix with the hydrocarbons and so help the combustion, yet the cold air has a tendency to cool off the furnace and retard combustion. With the automatic or mechanical stoker, the door is never opened, but the air is admitted with the fuel, and in the underfeed type must pass through it.

Again with the coking method of firing the pile of coke prevents the fireman from knowing when the right time comes for pushing the coke back onto the bed, and consequently the fire is often very thin at the back end and too much air is admitted. The underfeed mechanical stoker allows no thin parts, the fuel covering the tuyeres.

While hand firing, skilfully done, often produces excellent results by the coking or alternate methods of firing, yet all firemen are not skilful and even the best are liable to become weary of the hard work.



THE TAYLOR STOKER. IN OPERATION ALL PARTS OF THE FURNACE ARE PROTECTED BY GREEN FUEL AND ARE AIR COOLED.

It is obvious that for the best results the air should be supplied at a constant rate, likewise the fuel, in order that a large volume of gas will not be evolved in a short period of time. There should be an intimate

mixture of the air and the gas from the fuel. These conditions, which make for the best economy, are evidently found with mechanical stokers and more especially with the Taylor underfeed type, for with this form the liberated gases must pass through the incandescent coal and be completely consumed.

It is claimed that the two desired conditions, constant air supply and mixture of air and gas from the coal are found in the Taylor stoker. In this type the green or uncoked fuel is fed under coked and burning fuel, while at the same time the entire fuel bed is moved by gravity down an incline in such a manner as to rid itself of ash and clinker. The air enters under pressure from a fan and is so directed by the tuyeres as to produce complete combustion.

The underfeed principle is employed because it is the only method by which coal can be completely burned without expensive arches, special tiles, etc. The inclined principle is used, for it is the only way of positively and automatically cleaning the fire by gravity.

The Taylor stoker consists of a series of inclined retorts or fuel magazines, supported upon a blast box or reservoir. The inclined air ducts or tuyere boxes are capped with specially formed tuyeres through which air is forced into the fuel.

The coal descends from the hopper above to powerful cylindrical rams. There are two rams to each retort. The upper ram receives the coal from the hopper and forces it into the top of the retort. The lower ram receives its charge only as the coal descends from the upper ram, and it feeds just a sufficient quantity to maintain an even depth of fuel bed. The stroke of this ram can be readily adjusted to burn any coal.

The rams are actuated by connecting links and bell cranks which are driven by crank shafts. The crank shafts are, in turn, connected through the double worm gearing with a speed shaft, which is driven by the engine operating the blower.

The dumping plates, which are a combination dump and fire guard, are hung on the rear of the wind box. They are operated from the front of the stoker by means of a shaft, lever and link. These plates are dropped by disengaging a pawl and catch in the connecting link. They are raised by a hand lever, and the pawl engages automatically when they are in position.

Extreme simplicity is the chief feature of the apparatus. The driving cams can be readily withdrawn by the removal of a pin without dismantling the stoker. The crank shafts are in sections connected by universal couplings, and are secured to the main driving wheel in the power box by companion flanges which are easily disconnected. The power box is a complete unit with removable covers and caps of ample size and with all driving gears interchangeable. The tuyeres are all interlocking and no bolts are required to hold them in place. The dumping plates are made in sections and can be taken off by removing the keepers.

The stoker is driven by a positive connection from the main blower engine, which is of ample size to drive all the stokers of an installation. This eliminates the individual steam units, piping, leaky glands, valves, etc. It is stated that the durability Taylor stoker is due to the following causes: protection from the heat, elimination of large frictional resistances and weight of the parts.

The most important consideration is that the cast iron parts of the furnace are at all times protected by green fuel. As a further protection, all fuel-supporting parts—tuyeres, coal plates, etc., are air cooled and there are no moving parts in the furnace.

Wear of the moving parts is reduced, as the speed of the crank shafts and plungers is extremely slow (approximately two minutes for each revolution), and the power box reduction gears run in a bath of oil. Other claims for the Taylor stoker are summarized as follows: The crank shafts are of open hearth steel. The stoker is further protected from possible breakage by the insertion of a special shearing pin between the driving clutch and sprocket wheel on the speed shaft. These pins are of known strength, carefully tested and are designed to yield far below the breaking load of any of the moving parts of the stoker. This

feature acts positively to protect the stoker from being put out of commission, if for any reason the feeding mechanism becomes obstructed by any foreign substance in the coal. The life of the boiler front is also increased, as the air entering the furnace from the tuyeres is directed horizontally backward and carries the heat directly away from the front of the boilers. All refuse is deposited at the rear. This allows the retorts or fuel magazines to be placed close together and permits the use of a large number of retorts per boiler. As a result the air enters through a large tuyere area and is furnished at low pressure. This insures a thorough mixture of the gases and therefore complete combustion. Any blow pipe action, which is the result of high air pressure and a comparatively small area of combustion, is entirely eliminated. It is also claimed that there are no holes in the fire, and it follows from this that the air necessary to support combustion can closely approach the theoretically correct amount.

The fact that the inclined furnace construction permits a large number of retorts to be placed side by side obviates the necessity of rows of burning fuel and dying refuse. This results in a clean, even fire across the entire width of the boiler. The reduced amount of coal burned per retort also prolongs the life of the furnace, and decreases the necessary speed of all the moving parts. It further allows more time for cooking, an essential feature for the smokeless combustion of high volatile coal. Air is supplied to the stoker by a volume blower, which is, in fact, an essential feature of this system of stowing, as it is this which permits a proper regulation of the supply that is impossible with natural draft.

By the analysis of continuous samples of flue gas from each boiler, the proper ratio between the air and the coal supplied is determined. Once settled, the relative speeds of the blower and stoker are fixed, and as they are direct connected by countershafts and chain drives, there is no possibility of imperfect regulation. This scientific determination of the amount of air and coal to be used guarantees the highest possible efficiency.

In modern power plant practice it is now a generally accepted fact that boilers have a practically constant efficiency far in excess of the builder's rating. It is further conceded that their apparent lack of efficiency at high ratings has been due to improper furnace conditions.

The furnace conditions with the Taylor stoker are such that a range of 200 per cent. and over of rated boiler capacity is readily attainable. In this stoker the ability to burn efficiently the maximum amount of coal per hour is made possible by the use of a large number of retorts per boiler.

The coal is fed into the retorts at frequent and regular intervals in such a manner that the volatile gases are all burned. The fires are automatically sliced and thoroughly cleaned without opening the fire doors or retarding the progress of combustion. The coal and the air bear a fixed relation to each other, insuring a constant efficiency at all rates of combustion. The air is supplied mechanically and positively. By the use of this stoker sudden demands on the boiler requiring extreme rates of combustion are readily met, as a heavy fire is carried at all times. Further it is possible to meet a demand for steam from a banked condition, due to the large body of red hot coke.

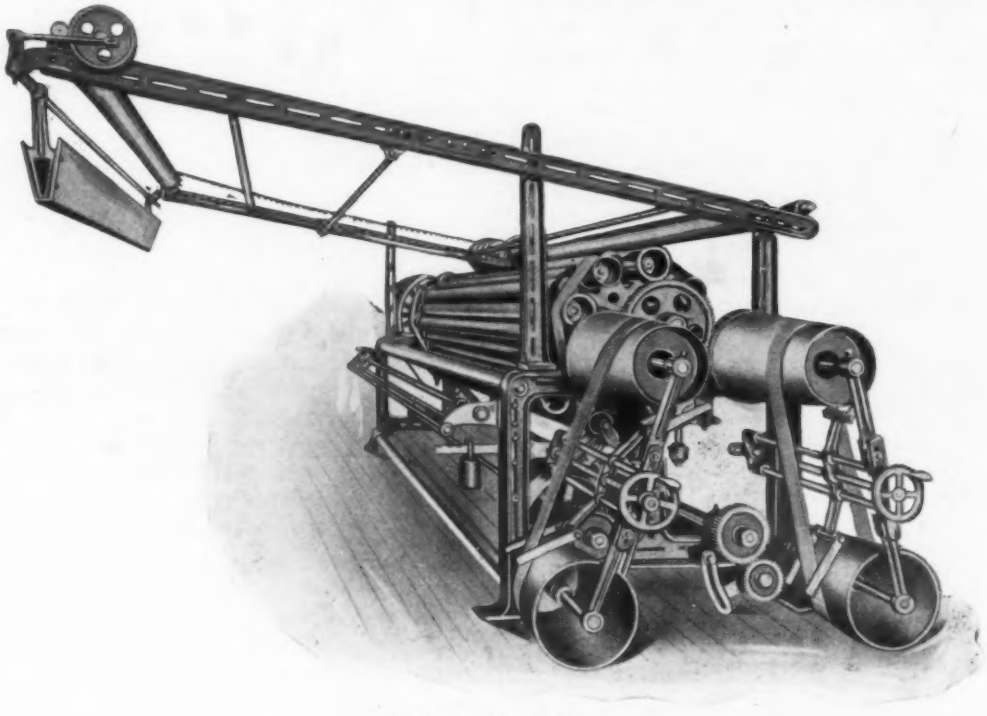
Buckram was originally a very different fabric from that now known by that name. In the 14th century it was described as a fine thin cloth, much used for wearing apparel, church vestments and furniture.

The exports of raw silk from India during the fiscal year ending March 31, 1908, amounted to 1,943,126 pounds, valued at $2,126,890, of which 29,072 pounds valued at $87,890 went to the United States; 1,297,245 pounds, valued at $1,338,397, to France, and 408,460, valued at $633,598, to the United Kingdom.

The poolah, or silk cotton tree, which grows in abundance in several parts of Southern India, is the well-known cotton coral and it has other names, such as kapok fiber tree, red cotton, and Malabar semul. The silk from its pods is collected and sold exclusively for stuffing pillows and beds.

DOUBLE ACTING NAPPER.

The accompanying illustration gives an idea of the general design and construction of the double acting napper built by the Cocker Machinery Co., Frankford, Philadelphia, for cotton and woolen goods. In the design of this napper every effort has been made to secure the best results in the finish of the goods as well as production. Self aligning bearings are used throughout, with special patented self lubricating bearings for



A DOUBLE ACTING NAPPER.

the worker rolls, insuring a light running machine and eliminating the risk of soiling the fabrics by throwing oil. The energy of the worker rolls controlling the character of the finish is easily changed while the machine is in operation. The cleaner rolls are outside of the cylinder where they can be easily adjusted. The number of worker rolls is determined by the kind of finish desired. A short, close, thick nap is produced and the best effects obtained on any weight of fabric.

The Cocker Machinery Co. also build a felting machine to be used in conjunction with their napper where it is necessary to felt in order to produce the desired effect.

HIGH SPEED CROSS QUILLER.

The illustration shows the latest improved high speed cross quiller to wind direct from the skein, built by the Oswald Lever Co. of Philadelphia. It has been installed in a number of mills and repeat orders are following. It has especially commended itself to silk people as a labor saver in winding the finest colored and mercerized yarns direct from the skein in one operation and at a high rate of speed, thus saving floor space and the operation of spooling.

It winds perfect shaped cops on to paper tubes as well as on to quills. By using the tubes instead of the more bulky wood quills, the shuttle is filled with yarn instead of half filled with wood. This is particularly desirable where coarse counts are used in a small shuttle, as the rewound cop in most cases

will carry 100 per cent. more yarn than the quill or mule cop. It can also be arranged by means of cleaners and tensions to wind from spools or mule cops equally successfully.

The builders present the following figures to show the amount of yarn that can be put on to the paper tubes:

25s single spun cotton yarn wound on paper tubes.

Length of tube 6 1/2 inches, of which yarn occupies 6 3/16 in.

Diameter of cop 27/32 in.

Weight of cop 487.65 grains less the weight of tube (33.88 grains).

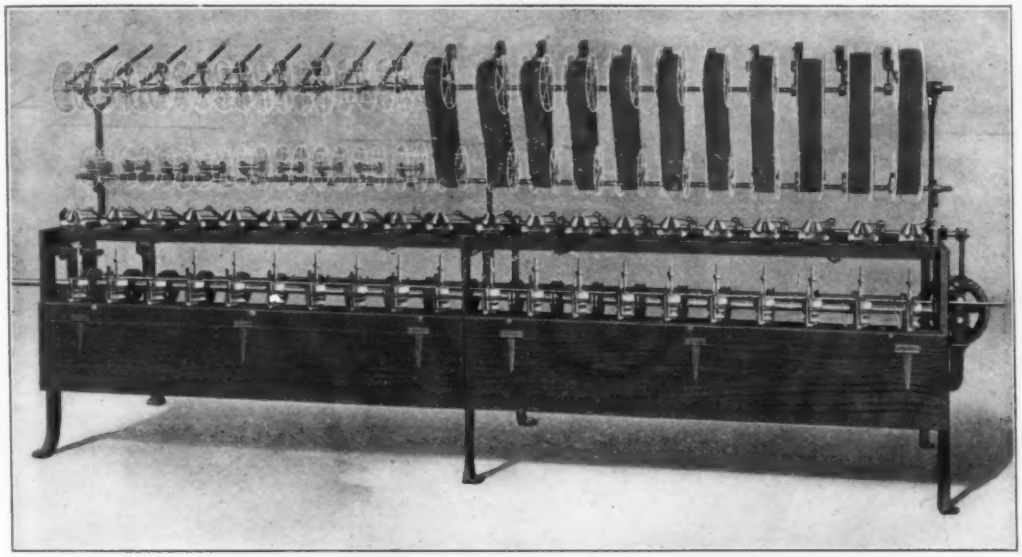
Net weight of yarn 453.77 grains.

Single 25 cotton yarn weighs 21,000 yards per pound of 7,000 grains, therefore, 21,000 × 453.77 divided by 7,000 gives 1,361.31 as the number of yards of yarn on the paper tube.

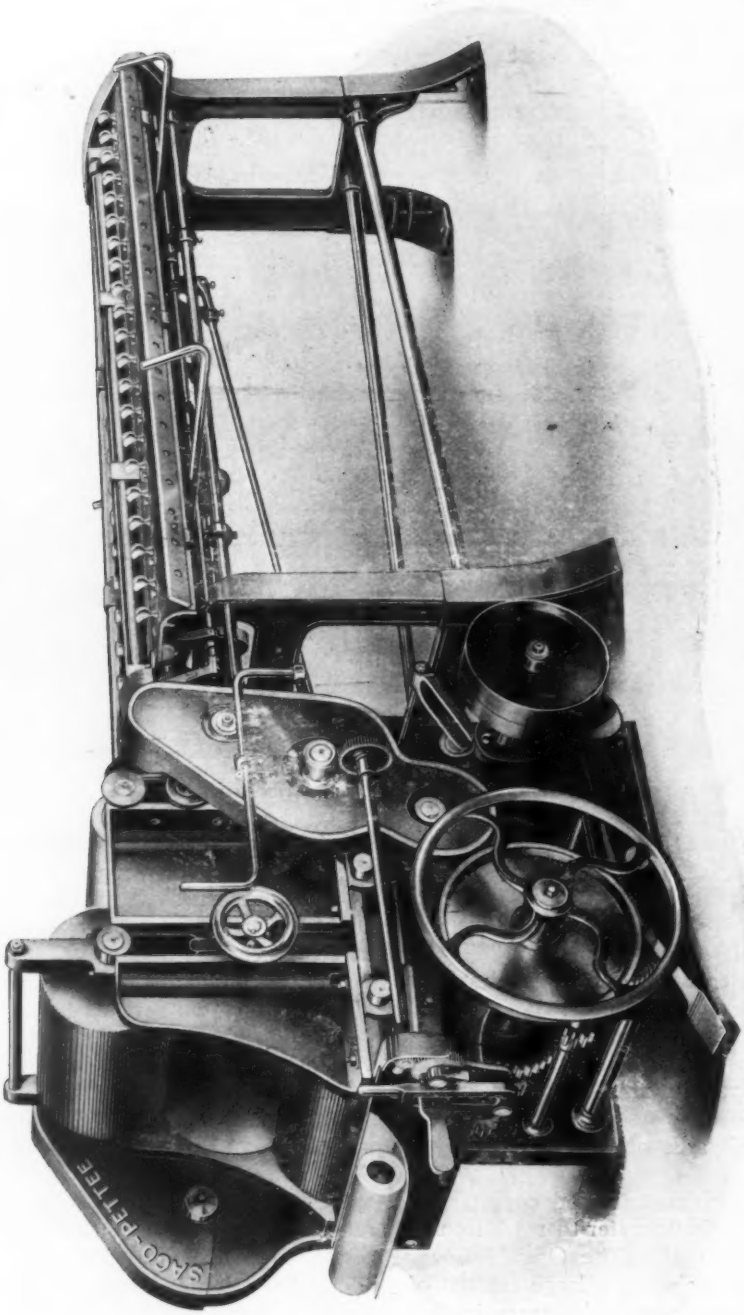
The same machine will wind cops of any size from 5/8 in. in diameter to 1 3/8 in. and up to 9 in. in length. The Oswald Lever Co. are not only shipping a large amount of textile machinery to manufacturers in this country, but are doing a good business and shipping considerable machinery to England every year.

AN IMPROVED LAP WINDER.

To meet the requirements of double carding on revolving flat cards the Saco & Pettee Machine Shops have recently put on the market an improved lap winder (patents applied for) shown in the accompanying illustration. Since the revolving flat card has been in extensive use in this country, there has been much discussion among mill men as to the comparative merits of the old system of double carding on top flat cards and single carding on revolving flat cards. The economic advantages, however, of single carding on revolving flat cards in the manufacture of ordinary goods, such as print cloths, etc., have been sufficient to displace the top flat card almost entirely for either double or single carding. Many successful manufacturers of higher grade goods have regretted the loss of double carding. As a result the revolving flat card has been adopted for double carding. By this means superior goods are being produced at less cost than was previously possible from single



A NEW HIGH SPEED CROSS QUILLER (PATENT APPLIED FOR.)



AN IMPROVED LAP WINDER BUILT BY THE SACO & PETTEE MACHINE SHOPS.

carding. For some purposes, also, yarns can be made from double carding, superior to combed yarns from the same stock, at less cost and with less waste. For the shorter staples, double carding in place of combing is rapidly coming into favor. As a result the new lap winder will be welcomed by spinners who desire to use the carding process on the revolving flat card. The lap winder is made in two sizes, 20 and 22 1/2 inch, to make laps for cards 40 and 45 inches wide.

The back or stop motion section, which is of an entirely new design, takes 42 cans, or 21 on each side, from the breaker cards, and forms a lap 19 1/2 or 22 inches wide, from the 42-breaker card slivers, as may be required. A stop motion is provided on each side to stop the machine when an end breaks down or runs out. The details of the stop-motion are the same as on the latest Saco and Pettee drawing frames, with stamped steel spoons, which can be adjusted to accommodate any size of sliver required.

The calender or lap head is of an entirely new construction, with extra heavy frame, machined racks working in grooves milled in the frame sides. All gear and rack teeth are cut from the solid, assuring a smooth running, noiseless and durable machine. A very solid square-ended lap is formed on a hardwood spool, and two of these laps go onto the finisher card.

Any further information, or descriptive catalogue, will be furnished upon application to the Saco and Pettee Machine Shops, Newton Upper Falls, Mass.

THE DUCKWORTH PATENT TRAVELER MAGAZINE.

THE DUCKWORTH PATENT TRAVELER MAGAZINE.

One of the regular expenses of operating ring spinning frames is the replacement of travelers. This expense, which amounts to a large sum in the aggregate, is due to two causes. First, the actual wear, and second, the loss of travelers which are never used at all. The number lost or thrown away is estimated by spinners to be fully as great as the number actually used. Observations in

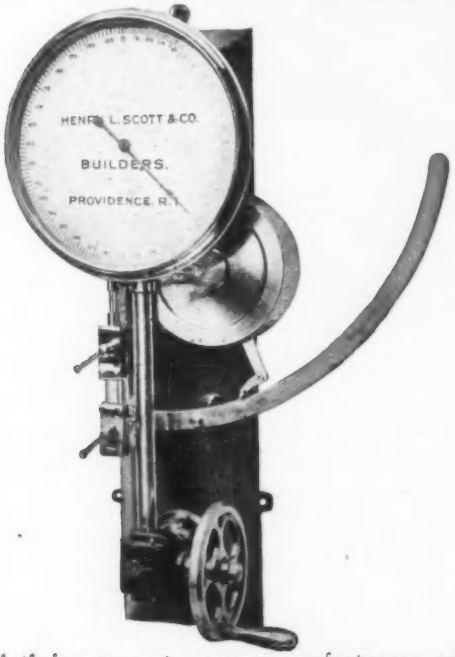
spinning rooms show travelers distributed the entire length of creel boards, also in pockets of doffers and other convenient places from which they are later dropped to the floor or thrown away.

Travelers have a faculty of bunching together, so that it is difficult, if not impossible, to separate them without loss.

The Duckworth traveler magazine, recently brought out by the Draper Company, Hopedale, Mass., which we illustrate, takes a bunch of the travelers, and in regular operation drops them singly so that there is no excuse for losing travelers in handling.

THE SCOTT CLOTH TESTER.

Now that the requirements of buyers and purchasing agents for the government and other institutions become more exacting, the need of an accurate and standard testing device to determine the breaking strength of



cloth is apparent among manufacturers, selling agents, as well as purchasing agents for large concerns and departments which buy on specification. The breaking strength of yarn has for years been an important factor in its purchase and sale.

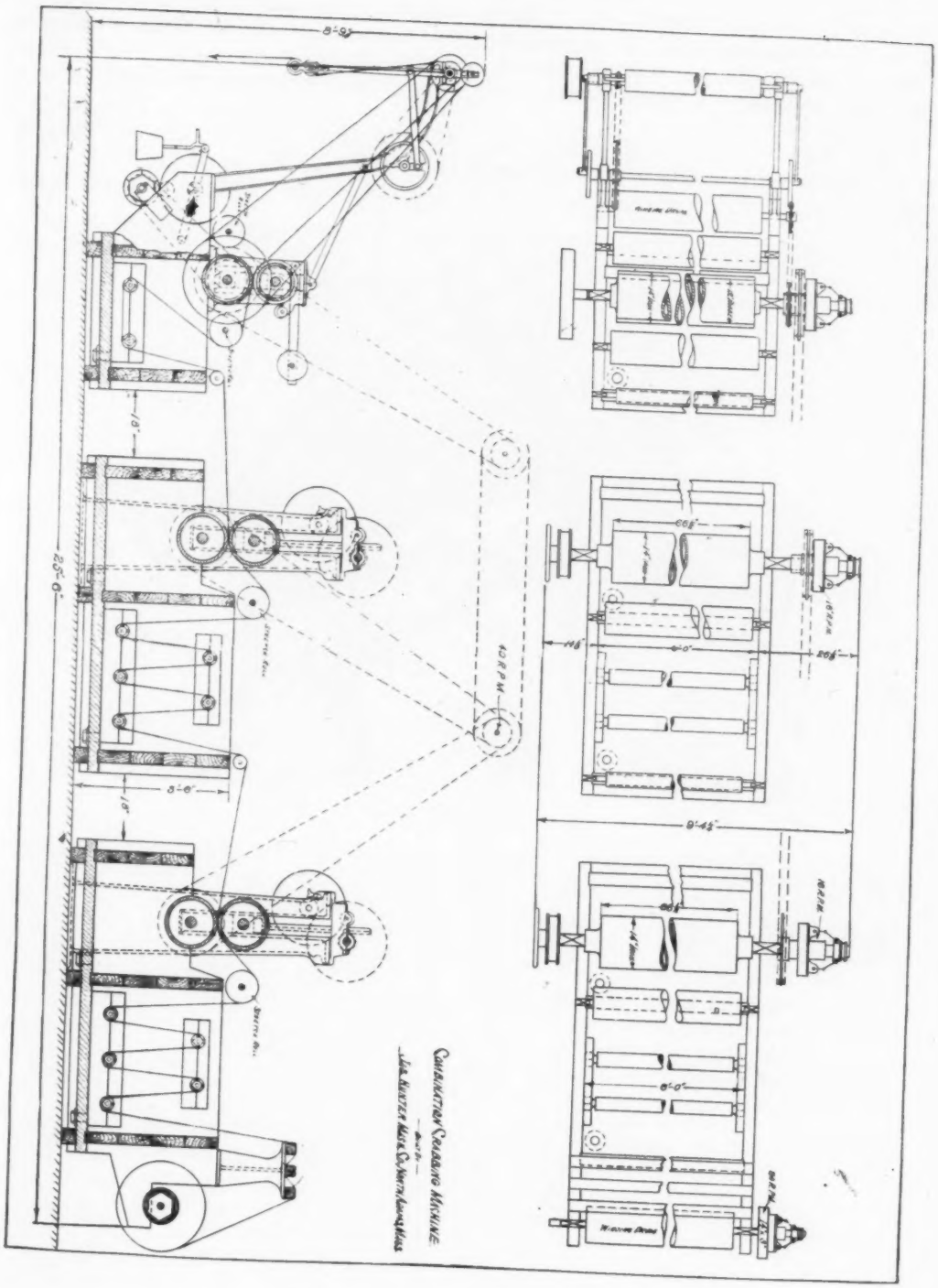
The cloth testing machine illustrated herewith operates on the same principle as the standard yarn testers and gives very accurate and uniform results. The clamps for holding the cloth are so arranged that during the pulling on the fabric there is no chance for the cloth to bind or draw over the edge of the apparatus and thereby cut or break the material except directly between the jaws. Like the yarn tester it can be operated by power, thus avoiding the variations incident to hand operation. A number of these cloth testers are in use and references will be given on application to the builders. It is built by Henry L. Scott & Co., 227 Eddy St., Providence, R. I., who also manufacture yarn testers, twist counters, roving reels, etc.

THE HUNTER CRABBING MACHINE.

This is a new form of the standard Hunter crabbing machine which has been in successful use for many years. The new machine is adapted for either the continuous or intermittent process of crabbing goods. The common method consists of winding intermittently onto and around the bottom rolls and alternately from one roll to the other. The continuous process consists of passing the fabric through the conditioning vats and press rolls without stopping, and folding the goods at the delivery end.

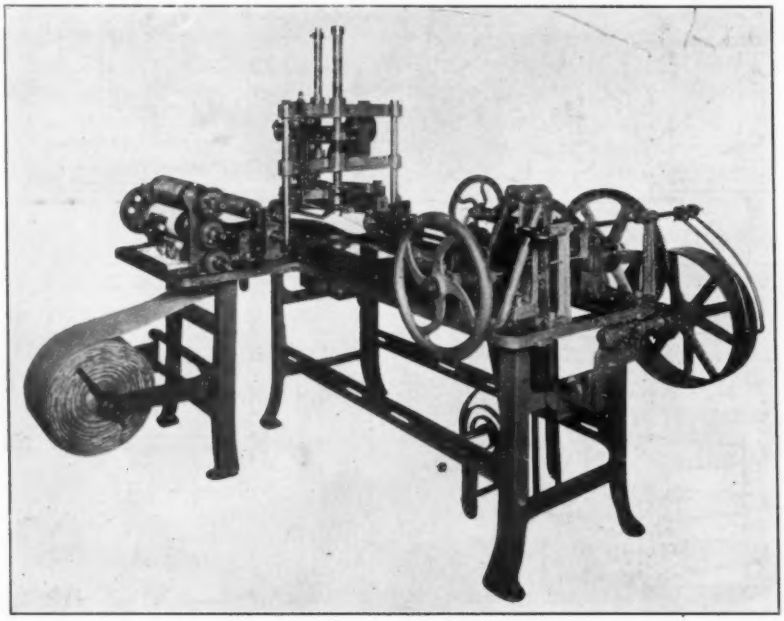
A very durable and uniform finish is obtained by a limited use of the continuous process combined with the regular method, because it conditions and has the effect of giving a uniform finish over the entire surface of the goods treated. This combination machine is adapted for piece dyed, fancy worsteds, suitings, dress goods, mercerized worsteds, resist dyed worsteds, panamas and serges, also for meltons, broadcloths, flannels and face goods before gigging.

Among the claims made for it are the following: It develops the pattern; sets the weave, imparts luster, prevents wrinkles or cockling, gives softness yet firmness to the fabric; makes cloudy goods impossible, brightens the colors and imparts a uniform finish that can be duplicated without trouble. It may also be used in securing the so-called "London shrunk" finish if desired. On goods that require but little treatment the


8'-9"
25'-0"
10'
8'-0"
10'
10 R P M
9'-4½"
6'-0"
Combination Crabbing Machine
Wm. Hunter Mach. Co. North Easton, Mass.

continuous method of crabbing can be used alone. It is stated that because of the combination feature this machine differs from any other crabbing machine previously offered to the trade.

The machine is made in three sections, as shown in the accompanying illustration. The tanks are made from 3 inch clear cypress lumber tongued and grooved and thoroughly bolted, and are provided with valves and over-flow pipes. The first and second sections are fitted up with 14 inch heavy cast iron rolls. Provision is made for raising the top rolls by a hand wheel, rack and pinion and also for applying extra pressure. Improved stretch rolls are provided in front of each set of rolls, which can be adjusted to give such tension on the goods as may be desired. The small rollers in the vats are made of brass tubing. The third section has a 14 inch cast iron bottom roll and a 12 inch rubber covered top roll. Pressure is applied by a lever and weight. Provision is made for either winding or folding the goods after passing through last section. The machine is driven from overhead counters by sprocket chain and friction clutch pulleys. The builders are the Jas. Hunter Machine Co., North Adams, Mass.



THE EPPLER MACHINE FOR MAKING PAPER CONES.

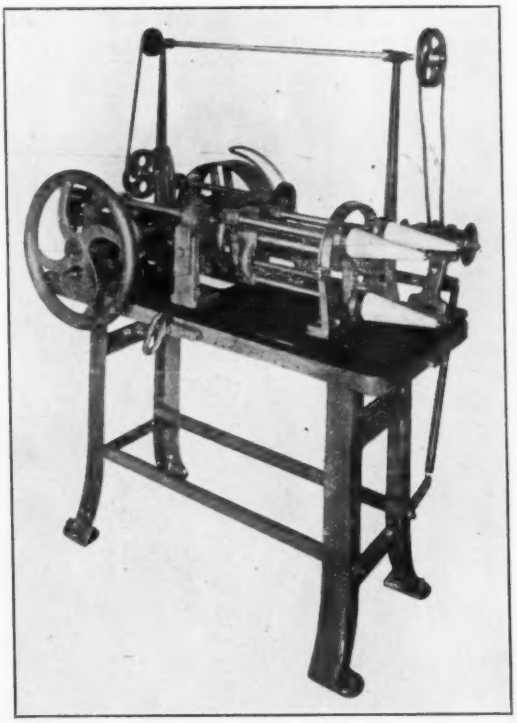
COP TUBE MACHINERY.

The old established firm of John Eppler's Machine Works, 629 Filbert St., Philadelphia, Pa., is so far as we know the only concern in this country building a special line of machinery for the manufacture of paper cop tubes and cones used in cotton mills. This includes double spindle machines for making tubes of any taper from 5 1/2 to 9 inches in length, the production of the machine being 60 tubes per minute. Another double spindle machine is suited for tubes from 3 to 5 inches in length with a production of 75 tubes per minute. A single spindle machine makes paper cops from 3 to 4 inches in length at the rate of 85 per minute. The shell machine is suited for straight or slightly tapered heavy shells, 1/2 to 3/4 inches in diameter and from 5 to 6 inches in length. The tubes are made from paper 10 to 15 inches in width and at the rate of 40 tubes per minute. These machines are of the best material and workmanship and are

thoroughly tested before leaving the works so as to be ready for starting up when received. The Eppler machines are automatic, taking the paper direct from the roll, applying paste, cutting out the blanks, rolling up and knocking off the finished tube. The line of machinery includes a corrugating and polishing machine for either taper or straight tubes. This machine has 3 spindles and a production of 60 tubes per minute.

We illustrate the latest machine for making paper cones, also a machine for trimming them. This cone making machine is also automatic, taking the paper from the roll, applying the paste, blanks the cone out, turns the blank over to the cone spindle to be wound, from which it is stripped, then finished and when dried is ready to be trimmed. The production of the machine is 20 to 25 revolutions per minute, one cone being made at each revolution. The operator feeds the cone to the trimmer, which trims both ends at the rate of 60 cones per minute, which is the production of 3 cone making machines.

The John Eppler Machine Works, 629 Filbert St., Philadelphia, have been engaged in the building of this class of machinery for 20 years and as a result can now turn out machines which they believe to be unequaled for efficiency, durability and economy.



THE EPPLER MACHINE FOR TRIMMING PAPER CONES.

The art of calico printing was not known in Europe until the 17th century, when Augsburg became celebrated for its colored cottons.

In the Philippines the total imports for 1906 amounted to $26,400,000, of which only $2,210,000 were free from duty. Great Britain's share was $5,554,000, more than half of which consisted of cotton goods, while out of the imports of $4,488,000 from the United States only $471,000 were cotton goods.

A NEW WORSTED COMB.

We show in the accompanying illustrations a new worsted comb built by James Smith & Son, Worcester, Mass., and which is in successful operation in a number of representative worsted mills. Very gratifying reports have been received from them and in several cases repeat orders have been given. The sole selling agents are Speed & Stephenson, 170 Summer St., Boston, Mass.

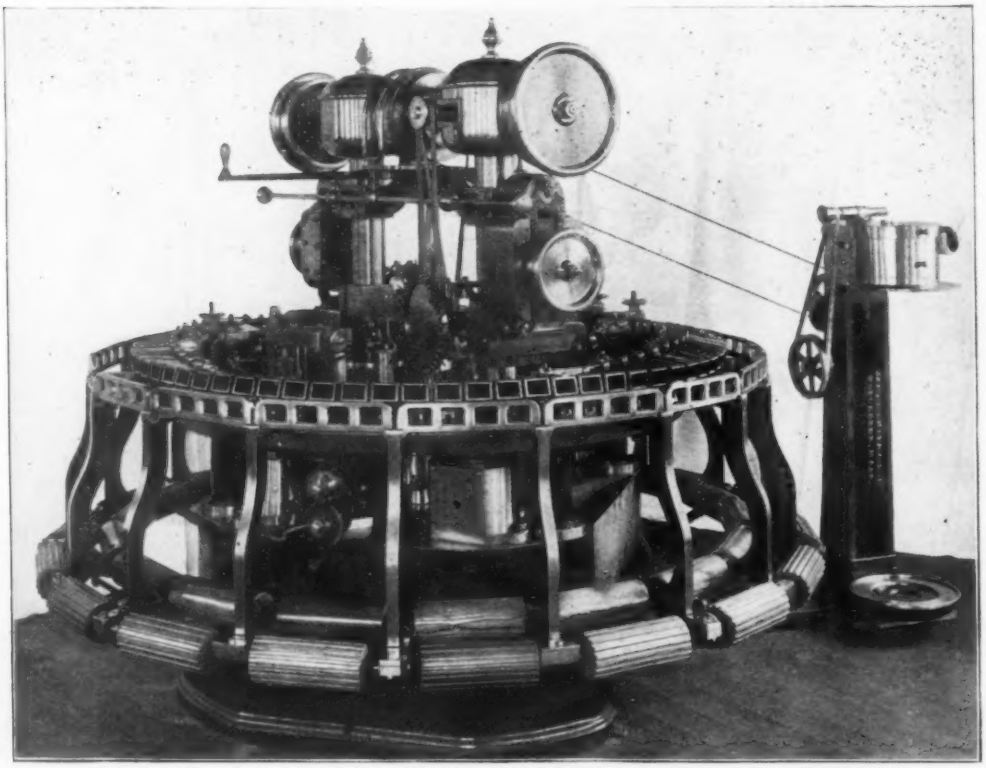


FIG. 1.

Fig. 1 is a general view of the machine and Fig. 2 a sectional view. The machine is constructed after the style of the English machines now in general use, all the parts being made in duplicate by automatic tools of the best material and workmanship that can be produced. All the studs and rolls, etc., are thoroughly case-hardened and made from the best Yorkshire iron. Particular attention is called to the design of this machine. The base frame is very heavily constructed and built up in sections, all of which are built to ensure steadiness when in operation. The columns or pillars are made square at the positions for the mounting of the dabbing motions, star wheel fixings, etc., and fitted with split bushes for the top driving shaft. The upright shafts are disconnected at the bar of the comb and fitted with solid clutches so that the circles can be readily changed when desired. In doing this a perfect drive is assured as when the machine is in operation the upright shafts are practically in one piece, and backlash is avoided. It must also be noted that with this arrangement the gearing under the comb is never disturbed when a change of circles is required, unless a different draft is needed.

One of the special features which particu-

larly recommends itself is the additional bearings for the upright shafts, there being six for each shaft, instead of two as on the old style of machines, thereby ensuring a free and perfect alignment. All pulleys and fly wheels are made on the plate system and

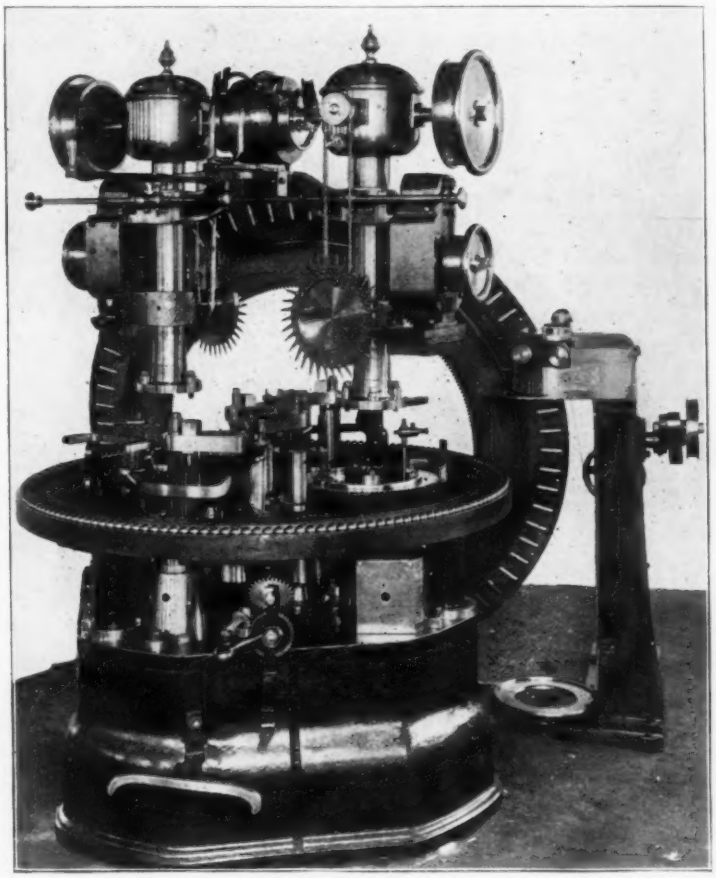


FIG. 2.

are thoroughly balanced, guaranteeing absolute steadiness when in motion. The dabbing motions are counter balanced with double eccentrics and can be run at high speed if desired, without danger.

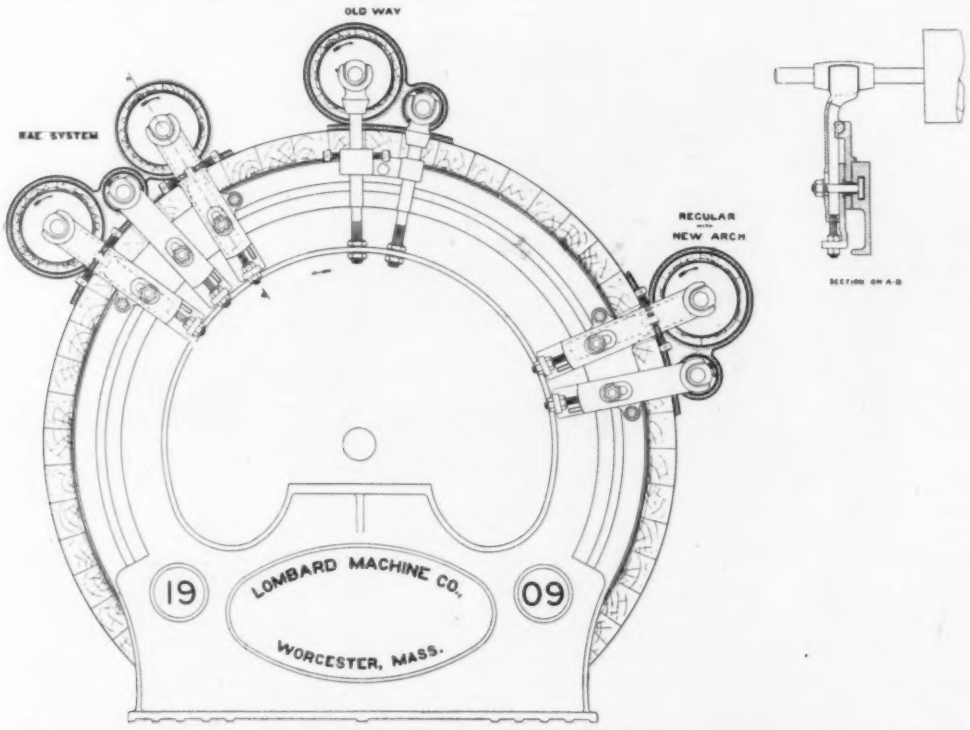
The rolls are mounted on improved stands direct to bed plates and fitted with patent adjustable lock screws, thus doing away with check nuts, wires, pawls, etc., that are generally used, and assuring a perfect grip on the pressure screws when the required amount of pressure is applied. The circle shafts are mounted the same as the rolls, with quadrants for the small circle shafts and so arranged that the gears on same can be changed without disturbing the position of the main stand. These shafts and rack gears are made in one solid piece or separately as desired and are case hardened. The leather motion is equipped with elliptical gears. The runners or guides for the leathers are made as near dust proof as possible and so arranged that practically no fly will collect on top as no nuts are used. The studs for the runners or guides are grooved so that a headless screw fits in them. The runners

are also chambered out at the lower ends and a wadding inserted which acts as an automatic lubricator, as well as preventing the clogging of waste or any foreign substance.

The plough and noil knives are of the ordinary pattern, the studs for the noil knives being so arranged that they can be taken out and replaced without disturbing the relative position of the angle to which they are set for the throwing of noils. The stands for the feed knives are fitted on shoes so that they can be readily taken off when changing circles. The large circle plate runs on ball bearings mounted on an extra deep well designed to distribute the weight more evenly and with perfect steadiness. The creel rolls are fitted with ratchets and adjustable screws so that every roll can be set as requirements demand. The feed boxes are made of cast iron, steel or brass. The coiler is the same as is generally used and is driven by a belt or rope and the whole machine, coiler included, fit on a heavy foundation plate.

THE LOMBARD ADJUSTABLE ARCH.

There are manufacturers favorably impressed from reading and learning of the Rae system of carding who hesitate to give this twentieth century product a trial for fear through its adoption an expensive machine might be left idle and prove a waste of money.



The Lombard Machine Co., Worcester, Mass., are now placing on the market one of the most perfect arches ever brought to the attention of the woolen manufacturers. Through the use of this slotted arch all cards equipped with the Rae system may be changed at will to the regular one worker and stripper, obtaining desired spacing by removing the extra workers. Again, should the manufacturer wish at some future time to add another worker or desire more spacing through the removal of a worker and stripper, this may be readily accomplished by slipping the remaining workers and strippers to any desired position. In this manner an ordinary card may be made ready for worsted work as far as main cylinder and worker

are concerned, by substituting larger workers and strippers for the smaller.

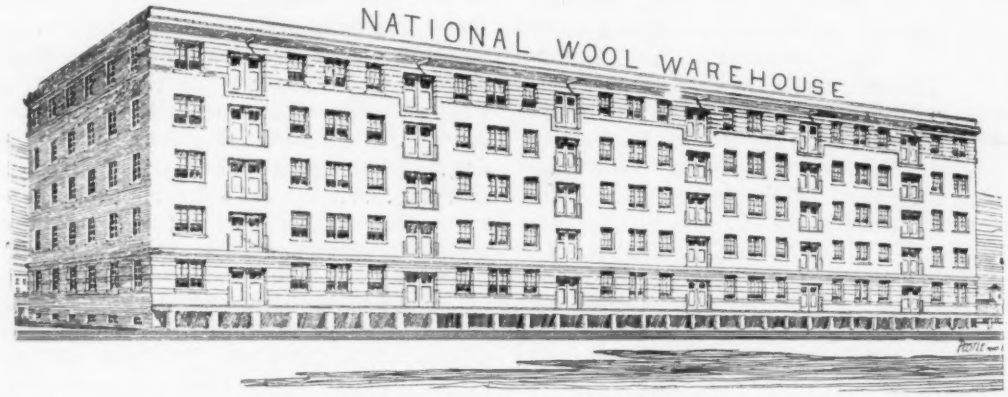
On the ordinary card this would be absolutely impossible without the addition of new arches, shanks and arch caps necessitating a considerable expense. There is no cramping of bolts and screws about the Lombard slotted arch. The shank turns upon a pivot. Its adjustment is both positive and accurate and there is none of that cramping of shanks so common with other arches. Extreme rigidity and substantial construction are guaranteed.

THE NATIONAL WOOL WAREHOUSE.

The construction of the wool warehouse at Chicago by the National Wool Warehouse and Storage Co., is being pushed and it is expected that the building will be ready for the new clip. The building, of which we show a plan, will be 250 feet long and 100 feet wide, five stories and basement. It will be built of brick with reinforced steel columns and floors, making it absolutely fireproof.

This warehouse is located on the corner of 45th and Robey Sts. and has direct connection with the Chicago Junction Railway. All switching charges inbound and outbound are borne by the roads delivering or receiving, thus avoiding any cartage expense. Opposite the warehouse is the Union Freight House. This freight house receives and delivers to all roads entering Chicago, less than car load shipments without any charge to the shipper, thus all cartage expenses are avoided. Being located on the Junction Railway all cars will be delivered to the road at night and will leave by train that evening, expediting the movement of the commodity. The eastern shipper will have the privilege, without any extra charge, of taking advantage during the lake season of shipping via lake and rail.

The building will be equipped with the most modern machinery. An effort is being made to have this the best wool warehouse in the United States.



The exports of cloth and dress goods from Germany increased from 52,171,859 pounds, valued at $40,419,858 in 1902, to 57,423,216 pounds, valued at $52,478,762 in 1905.

During the last five years the number of manufacturing establishments in New York State have increased from 35,957 to 37,194, representing a capital of $2,031,459,515.

As a result of sheep killing by dogs, wolves and coyotes in the United States, it is necessary to import annually over 200,000,000 pounds of foreign wool, costing over $40,000,000 to supply the demand.

The total area under cotton in the 16 cotton growing districts in India are now reported to be 186,202 acres, or 3,518 acres more than last year.

During the year 1906-07 the quantity of raw cotton exported from India was about 369,830 tons, valued at nearly 70 millions of dollars. The principal buyers were Japan, Germany and Belgium.

Dyeing, Bleaching, Printing, Etc.

THE EFFECT OF ILLUMINATING GAS UPON DYED FABRICS.

In connection with an exhaustive study of the influence of sulphur in gas, Mr. Arthur D. Little, chemical expert and engineer, Boston, recently undertook to determine whether or not the sulphur gases given off by burning gas have a marked bleaching action upon dyed fabrics, and further to determine whether oxide gas would be more active in this regard than street gas. For this experiment a number of carefully prepared samples covering the more important classes of dyes were furnished by the Badische Company. Under their popular names the colors were as follows:

Sample No.	Popular Color Name
1	Navy Blue
2	Scarlet
3	Maroon
4	Scarlet
5	Old Rose
6	Purple
7	Brick Red
8	Terra Cotta
9	Canary Yellow
10	Greenish Black
11	Magenta
12	Cardinal Red
13	Bright Blue

Separate sets of these samples were exposed for equal intervals of time in the experimental room to the action of burning street gas and oxide gas. When these samples were compared at the end of the experiments with blanks which had been kept in a sealed jar it was found that the only sample in which a marked change had occurred was No. 11, in which case both the samples exposed to oxide and to street gas were considerably darker than the original sample. There was a possibility that a slight change had occurred in several others of the samples but this, if any, was extremely small. There seemed to be a slight tendency in samples 3, 5, 6, 7, 8 and 13 to have become somewhat darker when exposed to the air of rooms in which gas was burned. These pieces of sample 10 which were hung in experimental room had lost part of the green tinge which characterized the original sample. In no case was there any indication of a bleaching action.

JIG DYEING.

Editor Textile World Record:

I notice in your March issue the replies of "Saxon" and "Dunloe" to the inquiry of Poplar (1055), and still maintain that a satisfactory aniline black cannot be dyed on a jigger. After giving formula "Saxon" adds that the result is not so fast as sample you sent, which shows the result from a jig is not the thorough aniline black as understood by the trade.

If a few blacks were required to go along with a long line of colors, they might pass muster, but would never go with any house handling proper aniline blacks in quantity.

Regarding the washing of jig dyed goods, an open soaper is out of the question. The washing of prints and jig dyed goods is as different as day from night. Ninety-nine per cent. of jig work is direct colors or basic on tannin and antimony or iron. The little developed and sulphur color work on jig is hardly worth consideration.

Now neither a direct nor basic color would stand an open soaper. They would come out many shades lighter than they went in, and no dyer would know how much to allow. Again, the average jig dyeing establishment with say 6 to 12 pair of jigs may have just as many shades dyeing, and I guess to clean up an open soaper for each batch would hardly go.

In washing jig work it is customary with light shades to wash on same jig on to a shell and again they get both the box wash and spray in the mangle. Dark shades generally get an extra end in water on the jig before the shelling up wash. All cold. If you are keeping a standing jig to save dyestuff, wash on another jig.

Manhattan.

CHLORINATED WOOL.

HERBERT P. PEARSON, M. Sc.

(Continued from April)

In 1897 Meister, Lucius & Bruning took out a British patent for producing a silky luster on wool by chlorination, and it is a fact that, given certain conditions of moisture and temperature, the fiber does acquire quite a silky luster by the action of chlorine, either gaseous or in solution, while it becomes also distinctly bleached when the treatment is gaseous. The handle given to dress fabrics treated by this process, or composed wholly of chlorinated wool is, however, not liked by people in the trade, and the difficulties in the way of regulating the right conditions and ensuring evenness of action are so great that efforts to apply it to piece goods on a commercial scale have had to be abandoned.

The most remarkable chemical property of chlorinated wool is its action on dyestuffs. If wool and chlorinated wool be dyed together in the same bath with a direct dye the latter becomes much more deeply dyed than the former, and attempts have been made to turn this to practical account by weaving designs with chlorinated and unchlorinated yarns and then dyeing in the piece, the idea being that it is more economical for a manufacturer to make a large quantity of one design and then to have the pieces dyed different shades, than to stock differently colored yarns and make the pieces in smaller lots. Provided the cost of chlorinating does not exceed the saving in working there is no reason why this should not succeed commercially. Indeed, an intelligent manufacturer working hand in hand with a clever dyer and a skilful designer—if such a combination be possible in the present state of evolution of the textile industry—might produce some pretty effects by weaving ordinary wool yarn with yarn treated by the lustering process and then dyeing in the piece. The effects of any unevenness in the chlorinating of the yarn could be obviated in the design.

To distinguish chlorinated from unchlorinated wool the two simplest tests are physical in character. If a drop of water be placed on a piece of chlorinated fabric, it is absorbed fairly quickly, and the wet-out part has a circular contour, while in the case of ordinary wool the drop is absorbed very slowly and the contour of the wet-out part is irregular. Further, on wetting-out chlorinated wool, and rubbing together two surfaces of it between the finger and thumb, a very characteristic "scroop" is felt.

After a little experience these two tests are sufficient, though they may be supplemented by two others. The first depends on the dyeing properties of chlorinated wool already mentioned, comparative dyeings with untreated wool showing an unmistakable difference. The second is based on a phenomenon not hitherto published. Dry chlorinated and dry untreated wool rubbed together produce a charge of electricity in each sufficiently violent to disturb the gold leaves of an electroscope, whereas two pieces of ordinary wool, even of different class, give rise to no charge. The application of this property to textile fabrics has been protected by provisional patent in Britain and other countries. I observed this property one dry, frosty day when pulling off an all-wool shirt worn over a chlorinated wool vest, the crackle of the electric discharge being remarkable. I venture to suggest that an "electric" belt made with a chlorinated wool weft and an ordinary wool warp would generate a far more genuine electric charge than many of those so extensively advertised.

These tests should be useful occasionally to garment dyers who may get a chlorinated wool garment to redye, and find that it will not dye evenly. It is not generally of great importance in treating such goods with chlorine to see that the chlorination is perfectly even. On redyeing, therefore, an uneven effect, which no amount of stripping will remove, is sure to appear. In such cases the dyer cannot be blamed and should refuse responsibility where possible.

In conclusion, I would mention that the treatment by chlorine of wool fabrics intended for garments that have to be washed has one very grave defect, and that is the tendency—I might almost say certainty—of the garments to wear badly. They tend to

wear into holes at the elbows and knees and other places exposed to hard treatment. It is possible that by the time holes actually appear the same wear applied to an unchlorinated garment would have shrunk it too far for it to be any longer wearable; though I have never proved this by a strictly comparative wearing test. The fact remains, nevertheless, that such a defect is bound to tell against chlorinated unshrinkable garments in the long run.

It is not merely a case of the rotting of the fiber, for under certain conditions the treatment actually increases its tensile strength. The cause, most probably, is simply the removal of the felting property. The fibers of the ordinary wool garment become felted together more and more with each successive washing, thus increasing the strength of the fabric. In the case of chlorinated garments this does not take place. On the contrary, the mechanical action of wearing and washing tends to loosen the fibers one from another until they eventually come apart entirely.

A YARN DYEING MACHINE.

The dyeing machine shown in Figs. 1 to 3 is a French invention which has been patented in the United States. The skeins can be treated in the different boiling, washing, fixing, dyeing, loading and clearing baths without removing them from their carriers or supports.

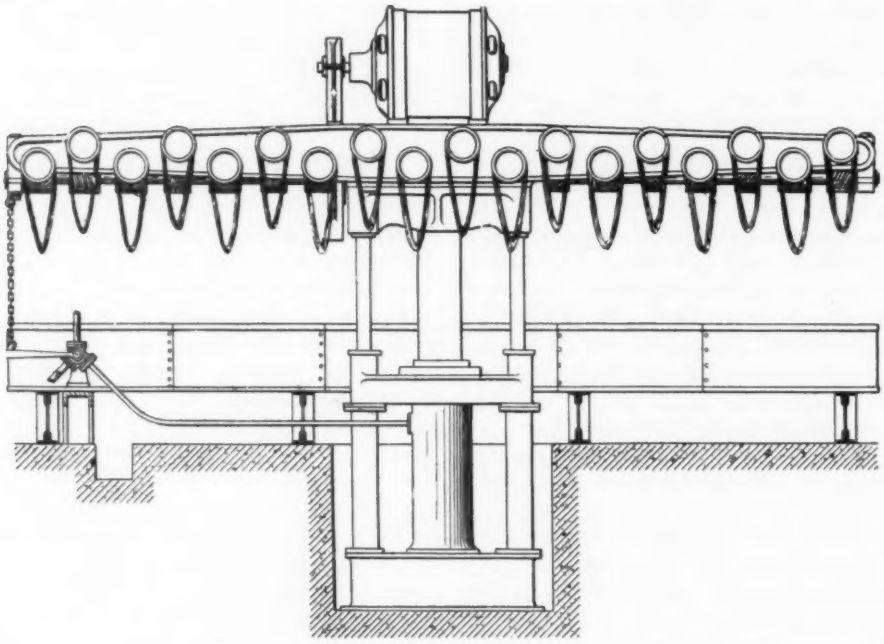


FIG. 1.

Fig. 1 is a front elevation of the machine; Fig. 2, a plan view; and Fig. 3, an end elevation. The machine comprises a horizontal frame carrying a series of parallel shafts, on which are mounted reels from which the skeins are suspended, the frame also carrying a driving shaft arranged transversely and centrally to the reel shafts. Each of the shafts is provided at its center with a worm wheel which gears with worms mounted on the driving shaft. The worms and worm wheels are alternately of right and left hand pitch, thus causing opposite movements to be imparted to adjacent reels, so that the threads of the skeins placed side by side are moved in different directions, this arrangement preventing entanglement.

The movement of the reels is produced by means of an ordinary electric motor, mounted on the frame of the machine and actuating the shaft by means of a suitable speed reducing gear inclosed in a casing.

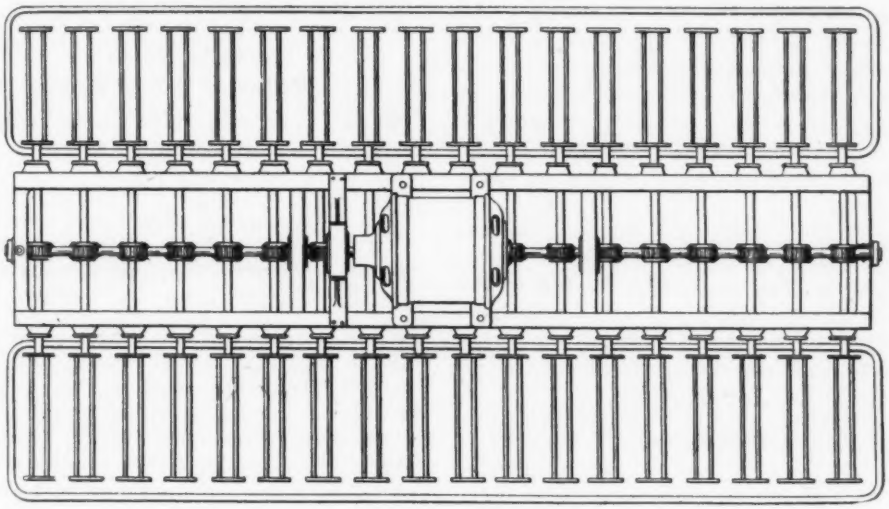


FIG 2.

For the purpose of obtaining greater regularity in the treatment and a more uniform action of the baths on the skeins, the reels are given unequal alternate movements. These movements are automatically obtained by reversal of the direction of rotation of the electric motor at unequal periods. This reversal can be effected as desired without appreciable periods of rest, or with stoppages of greater or less length and automatic restarting of the apparatus.

The proper movement of the skeins in the baths is obtained by mounting the reels eccentrically on their shafts, by which means the skeins are moved firstly in one direction and then in the other in the baths during each rotary movement of the reels.

By inserting a suitable resistance in the motor circuit, the reels can be given various speeds of rotation suitable to the proper treatment of the skeins in the different baths.

The frame of the machine is supported by the piston working in the cylinder of a hydraulic press for the purpose of raising the frame, and parts carried thereby to remove the skeins from the baths in which they are immersed. These baths are contained in vats located below the reels on each side of the apparatus.

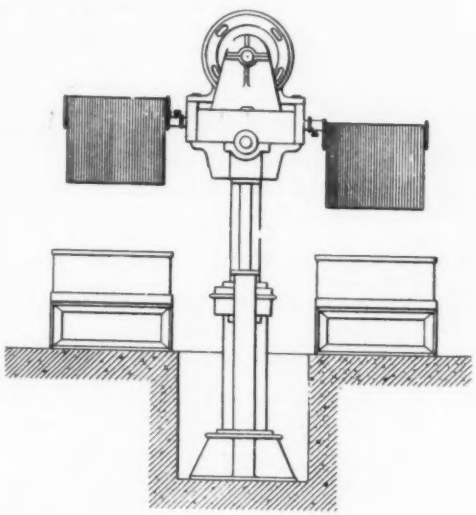


FIG. 3.

Two hollow vertical columns are provided in which guides secured to the frame are

adapted to slide for preventing lateral oscillation of the frame so that the latter in its upward or downward movements will remain parallel to the vats.

The cylinder of the press is fed by a pipe into which water under pressure is introduced from a main pipe. A three-way cock is arranged at the junction of these pipes by means of which the water can be admitted to the cylinder for raising the frame, or be discharged through an exhaust pipe to lower the frame.

During the raising or lowering of the frame, the stoppage of the movement is progressively and automatically effected by the closure of the three-way cock, which is operated by the frame at the end of its course by means of a lever and chain.

Color Cards.

The Cassella Color Co., 182 Front St., New York. A very elaborate color card of 168 samples showing dyeings fast to light on yarns for carpet and upholstery goods. They have also brought out another card showing dyeings on loose wool, fast to milling produced with anthracene chrome colors. This card shows 180 different samples.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 65.

Blue on Worsted Yarn.

Oxy Chrome Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Oxy Chrome Blue B.
(Geisenheimer & Co., 189 Front St., New York.)
3 lbs. Acetic Acid.
20 lbs. Glauber's Salt.

Enter at 120° F., bring to a boil and dye at a boil for one hour. Then exhaust the dye bath by adding

3 lbs. Sulphuric Acid.

Finally add

2 lbs. Potassium Bichromate

and boil 3/4 of an hour longer.

Oxy Chrome Blue B exhausts well and produces dyeings which are very fast to milling, and to all other tests ordinarily required of wool colors.

Recipe No. 66.

Yellow on Cotton Yarn.

Algole Yellow 3 G paste on 100 lbs. cotton yarn. Prepare the dye bath with

20 lbs. Algole Yellow 3 G.
(Farbenfabriken of Elberfeld Co., 66 Lafayette St., New York.)
3 gals. Hydrosulphite Solution (Hydrosulphite Concentrated).
½ gal. Soda Lye, 53° Tw.
160 lbs. Glauber's Salt.

Enter yarn cold, and dye cold for 3/4 to 1 hour, with the material immersed in the liquor. After dyeing squeeze well, expose to the air a short time, rinse in water acidulated with sulphuric acid, and then soap at a boil for about 1/2 hour.

Algole Yellow 3 G possesses excellent fastness to all of the common color destroying agencies.

Recipe No. 67.

Black on Worsted Yarn.

Chrome Black R on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Chrome Black R.
(Bischoff & Co., 451 Washington St., New York.)
5 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter at 140° F., bring to a boil and dye at a boil for 3/4 of an hour, then add

2 lbs. Sulphuric Acid

and continue the boiling until the bath is exhausted. Then add

3 lbs. Potassium Bichromate

to the bath and boil for 3/4 of an hour longer.

Chrome Black R possesses good fastness and leaves both cotton and silk effect threads in excellent condition.

Recipe No. 68.

Red on Cotton Yarn.

Columbia Fast Red F on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Columbia Fast Red F.
(Berlin Aniline Works, 213 Water St., New York.)

25 lbs. Common Salt.
½ lb. Soda Ash.

Enter at 180° F., and dye at a boil for one hour. Columbia Fast Red F. possesses excellent fastness for a direct cotton color. It can be most economically used in a standing bath.

Recipe No. 69.

Black on Worsted Yarn.

Chrome Black B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Chrome Black B.
(Bischoff & Co., 451 Washington St., New York.)
5 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter at 140° F., bring to a boil, and dye at a boil for 3/4 of an hour. Then add

2 lbs. Sulphuric Acid

and continue the boiling until the bath is exhausted. Then add

3 lbs. Potassium Bichromate

to the bath and boil for 3/4 of an hour longer.

Chrome Black B possesses good fastness and leaves both cotton and silk effect threads in excellent condition.

Recipe No. 70.

Reddish Violet on Woolen Cloth.

Fast Acid Violet 4 R on 100 lbs. woolen cloth. Prepare the dye bath with

3 lbs. Fast Acid Violet 4 R.
(W. F. Sykes & Co., 85 Water St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 120° F., bring slowly to a boil and dye at a boil for one hour.

Fast Acid Violet 4 R possesses remarkable fastness to scouring, fulling and light. It dyes easily level, and readily combines with other acid colors.

Recipe No. 71.

Olive on Cotton Yarn.

Paranol Olive on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Paranol Olive.
(E. Thayer & Co., 411 Atlantic Ave., Boston, Mass.)
25 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour.

Paranol Olive is exceedingly fast to washing, light and alkali and will not stain. Its fastness will admit of use in place of sulphur colors in many instances.

Recipe No. 72.

Blue on Worsted Yarn.

Alphanol Blue 5 R N on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Alphanol Blue 5 R N.
(Cassella Color Co., 182 Front St., New York.)
5 lbs. Acetate of Ammonium (Neutral).

Enter yarn at 120° F., and raise to a boil during about 1/2 hour, and then dye for 1 hour at a gentle boil or simmer. Acetic acid may be gradually added toward the end to insure exhaustion in the case of heavy dyeings.

Alphanol Blue 5 R N gives an excellent shade of navy blue of excellent fastness to light, alkalies and washing.

Recipe No. 73.

Bluish Green on Cotton and Woolen Union Cloth.

Naphtamine Blue Black H on 100 lbs. cotton and wool union cloth. Prepare the dye bath with

5 lbs. Naphtamine Blue Black H.
(Kalle & Co., 530 Canal St., New York.)
25 lbs. Glauber's Salt.

Enter at 180° F., dye at a boil for 1/2 hour and then dye in a gradually cooling bath for 1/2 hour longer.

Naphtamine Blue Black H will be found valuable for the dyeing of union piece goods, as it dyes the cotton a fuller shade than the wool. At the same time it doesn't stain effect threads of resisted worsted.

Recipe No. 74.

Orange on Cotton Yarn.

Algole Yellow R paste on 100 lbs. cotton yarn. Prepare the dye bath with

20 lbs. Algole Yellow R.
(Farbenfabriken of Elberfeld Co., 66 Lafayette St., New York.)
3 gals. Hydrosulphite Solution (Hydrosulphite Concentrated).
½ gal. Soda Lye, 53° Tw.
160 lbs. Glauber's Salt.

Enter yarn cold, and dye cold for 3/4 to 1 hour, with the material immersed in the liquor. After

dyeing squeeze well, expose to the air a short time, rinse in water acidulated with sulphuric acid, and then soap for 1/2 hour at a boil.

Algole Yellow R paste gives an orange yellow which possesses excellent fastness to all of the common color destroying agencies.

Recipe No. 75.

Black on Worsted Yarn.

Alizarine Chrome Black 2 B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Alizarine Chrome Black 2 B.
(Kalle & Co., 530 Canal St., New York.)
15 lbs. Acetic Acid.

Boil 1 hour, then add

10 lbs. Acetic Acid.

Boil 15 minutes longer and add

2 lbs. Potassium Bichromate

and then continue the boiling 1/2 hour longer.

Alizarine Chrome Black 2 B when dyed by this method will be found to give an excellent black and any white silk effect threads present will not be stained.

Recipe No. 76.

Red on Woolen Cloth.

Brilliant Acid Red 5 B on 100 lbs. woolen cloth. Prepare the dye bath with

3 lbs. Brilliant Acid Red 5 B.
(W. F. Sykes & Co., 85 Water St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 120° F., bring slowly to a boil and dye at a boil for 1 hour.

Brilliant Acid Red 5 B possesses remarkable fastness to scouring, fulling and light. It dyes easily level and readily combines with other acid colors.

Recipe No. 77.

Blue on Worsted Yarn.

Fast Marine Blue S X on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Fast Marine Blue S X.
(Atteaux & Co., 176 Purchase St., Boston, Mass.)
2 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 120° F., bring slowly to a boil and dye at a boil for 1 hour. Fast Marine Blue S X dyes easily level, is particularly fast to light, and withstands scouring and fulling. It is also fast to street dirt, alkali, etc., and is not changed by hot pressing.

Recipe No. 78.

Blue on Worsted Yarn.

Alphanol Blue B R on worsted yarn. Prepare the dye bath with

3 lbs. Alphanol Blue B R.
(Cassella Color Co., 182 Front St., New York.)
5 lbs. Acetate of Ammonium (Neutral).

Enter yarn at 120° F., and raise to a boil during about 1/2 hour, and then dye for 1 hour at a gentle boil or simmer.

Acetic Acid may be added toward the end to insure exhaustion of the dye bath.

Alphanol Blue B R possesses high coloring power and excellent fastness to light, alkali and washing.

Recipe No. 79.

Red on Cotton Yarn.

Columbia Bordeaux B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Columbia Bordeaux B.
(Berlin Aniline Works, 213 Water St., New York.)
20 lbs. Glauber's Salt.
1 lb. Soda Ash.

Enter at 180° F., and dye at a boil for 1 hour. Columbia Bordeaux B possesses excellent fastness for a direct cotton color. It can be most economically used in a standing bath.

Recipe No. 80.

Blue on Worsted Yarn.

Fast Marine Blue S R on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Fast Marine Blue S. R.
(Atteaux & Co., 176 Purchase St., Boston, Mass.)
2 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 120° F., bring slowly to a boil and dye at a boil for 1 hour. Fast Marine Blue S R dyes easliy level, is particularly fast to light, and also withstands scouring and fulling. It is also fast to street dirt, akali, etc., and is not changed by hot pressing.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Albany. Construction work on buildings for the Albany Cotton Mills will be started from May 15 to June 1, and according to present plans manufacturing will be started about September, 1910. The initial equipment will be 10,000 spindles and 300 looms for manufacturing fine sheetings, 36 to 60 inches. As reported previously the capital stock is $250,000. The company has organized with W. W. Pace, president; and J. A. Betjeman, treasurer. All correspondence should be addressed to the Albany Cotton Mills, Albany, Georgia, not to individuals. No contracts have been placed.

*Georgia, Manchester. Contracts for the equipment of the power plant for the new Manchester Cotton Mills have been awarded.

*Kentucky, Louisville. A building has been secured by the new Puritan Cordage Mills and they expect to begin manufacturing in about 60 to 90 days. Charles T. Wolfe has been elected president, and George W. Babcock, treasurer. 16 cards and 2,000 spindles will be installed. The incorporation of this company with capital stock of $75,000 was previously reported.

Massachusetts, New Bedford. The New Bedford Cotton Mill Corporation has been incorporated with capital stock of $1,000,000, of which $750,000 will be preferred stock, and $250,000 common stock. The incorporators are Wm. M. Butler of Boston, president of the Butler Mill of this city; Abbott P. Smith, Wm. C. Hawes, and Nathaniel Kerr, treasurer of the Butler Mill. Wm. M. Butler has been elected president; Walter H. Underdown, treasurer; and James O. Thompson, Jr., superintendent. Mr. Thompson is at present superintendent of the Wampanoag Mills of Fall River. It is intended to manufacture the finest goods that can be made in this country from cotton and silk. Plans are now being made by Lockwood, Greene & Co., and contracts for buildings and machinery will be awarded at an early date. The capacity of the mill will be 80,000 spindles, of which 60,000 spindles will be installed at first. The main mill will be 405 feet long, 130 feet wide, and 4 stories high. The weave shed will be 350 feet long and 200 feet wide.

*Massachusetts, New Bedford Nothing definite can be learned of the proposed new cotton mill projected by Andrew G. Pierce, Jr., of the Pierce Mfg. Corporation, and associates. It is probable that organization will be completed shortly, and buildings erected in the vicinity of the Beacon Mfg. Co. Some reports give the proposed equipment as 100,000 spindles.

*Massachusetts, New Bedford. The Dartmouth Mfg. Corporation have placed their complete order for combing machinery, including comber lap and ribbon lap machines, for their new mill with Wm. Firth Co. of Boston, after a very thorough test and consideration of various makes. The machinery will be manufactured by Messrs. Asa Lees & Co., Ltd., Oldham, England.

New York, Lestershire. The new Corliss Towel Mills recently started by John Paterson and O. S. Brown will shortly be incorporated. They are operating 4 looms.

*North Carolina, Laurinburg. Construction work has been started on buildings for the Waverly Cotton Mill, incorporated in January with capital stock of $300,000. A complete report of this project has been given.

*North Carolina, Marion. It is understood the Marion Mfg. Co., a new company in which D. D. Little of Spartanburg, South Carolina, is interested, is planning to construct a mill to be equipped with 12,500 ring spindles and 300 looms for manufacturing sheetings. This company was incorporated recently with capital stock of $250,000.

*North Carolina, Thomasville. C. C. Randleman advises that his new cotton mill company will have paid up capital of $100,000, and will equip and operate plant of 5,000 spindles and 200 looms on cheviots and chambrays. The officers and directors have not been elected as yet.

*North Carolina, Zebulon. Ground has been broken for the foundation for the Southern Spinning & Mfg. Co.'s plant, incorporated in January with capital stock of $300,000.

South Carolina, Columbia. Absorbent cotton and other surgical dressings for the drug trade will be manufactured by the Southern Aseptic Laboratories, Inc. They are equipping a plant with 40 cards and other necessary machinery, most of which has been contracted for. P. A. Schulz, formerly of the Maplewood Mills, Fall River, Mass., is general manager.

Enlargements and Improvements.

*Alabama, Eufaula. Preparations have been completed for installing 10 new cards and 500 Northrop looms in the Eufaula Cotton Mills.

*Georgia, Columbus. A new building, 176 by 106 ft., will be built for the Hamburger Cotton Mills, and will be completed in about four months. The new space is primarily to provide for the rearrangement of the present equipment, but they may buy more machinery later on.

*Georgia, Columbus. Contract for the erection of a two story addition, 84 by 210 ft., for the Perkins Hosiery Mills has been awarded to John H. Lowe of Atlanta, Georgia. In this structure 5,000 to 8,000 spindles and accompanying equipment

will be installed, to be operated by a new 400 H. P. electrical plant. The output will be white and colored yarns for the knitting trade.

*Georgia, Hawkinsville. It is again reported that 2,000 spindles will be added to the Southern Cotton Mills, formerly the Hawkinsville Cotton Mills.

*Georgia, Lafayette. Adams & Schneider of Chattanooga have been awarded contract for the erection of a 50 by 60 foot addition, 1 story high, to the Lafayette Cotton Mills. As reported previously, equipment for a new slasher room, 2,000 spindles and 40 looms, will be installed.

*Georgia, La Grange. Contracts for the equipment of power plant for the new 10,000 spindle mill, to be known as Unity Mill No. 2, have been awarded.

*Indiana, Monticello. New winding and dressing machinery for glazed cotton yarns has been installed in the Chicago Thread Mfg. Co.'s plant. This covers the reported enlargement.

*Maine, Biddeford. It is reported that the Pepperell Mfg. Co. has awarded a large contract for Draper looms.

Maine, Lewiston. Seventy-five new cards and 35 new spinning frames are being installed by the Bates Mfg. Co. and 30 old spinning frames will be taken out.

Maine, Lewiston. Work has been started on the foundation for the new 4 story brick addition to the Hill Mfg. Co. The new structure will be 15 by 77 ft. About 25,000 spindles will be added.

Massachusetts, Adams. A third story is being built on one of the buildings of W. C. Plunkett & Sons. This will enlarge the warp room and new spinning and twisting machinery will be installed.

Massachusetts, Blackstone. A six story building, 150 by 100 ft., will be erected for the Blackstone Mfg. Co., to be used for storage purposes.

Massachusetts, Clinton. The Lancaster Mills are installing new machinery and will also add new boilers.

*Massachusetts, Dodge. Repairs will be made at once on the plant of C. W. Pike, recently reported damaged by fire. This mill was recently changed from satinets to cotton goods.

*Massachusetts, Easthampton. An addition, 152 by 100 ft., is being erected to one of the buildings of the Hampton Co.

Massachusetts, Fall River. Plans are being prepared for an addition to No. 1 mill of the Barnard Mfg. Co. It is understood that most of the new machinery will consist of cards. Construction work will be started next month.

*Massachusetts, Fall River. A new building. 60 by 110 ft., will be built for the Estes Mills to be equipped for a knitting department. Another building will be erected for cleaning cotton waste.

*Massachusetts, Fall River. Good progress is being made on the addition to the American Linen Co. As reported previously 9,000 spindles will be installed in this enlargement.

*Massachusetts, Fall River. The Osborn Mills have put in new spoolers and warpers and are installing 31 Whitin revolving flat cards, replacing 98 old style cards. These changes in addition to changes and improvements in the cloth room comprise the substance of changes made and at present contemplated and are all in No. 1 Mill. No. 2 Mill is on fine work and equipment is up to date and in excellent condition.

*Massachusetts, Fall River. Rapid progress is being made on the new Davis Mill and it is believed that the engine will be installed in about two weeks.

Massachusetts, Fitchburg. A brick storehouse, 3 stories high, 140 by 52 ft., will be erected for the Orswell Mills. Cotton yarns are manufactured on 50,000 spindles.

Massachusetts, Lowell. Before next winter three pairs of horizontal water wheels with a maximum capacity of 3,000 h. p. and also a 1500 k. w. generator, driven by a steam turbine, will be installed in the Massachusetts Cotton Mills. Power will be distributed to different parts of the plant electrically. Lockwood Greene & Co., Boston, are preparing plans. The Massachusetts Cotton Mills also expect to nearly double the size of their dyehouse, but will not increase the machinery equipment, merely moving a part of the present equipment from the temporary location now occupied.

Massachusetts, New Bedford. Another story will be built on the two-story building of the Kilburn Mill and new machinery will be installed.

*Massachusetts, Three Rivers. Plans for a new weave shed, to be built for the Palmer Mill of the Otis Co., have been completed, and contract for buildings has been let to the Flynt Building & Construction Co. of this town.

New Hampshire, Salmon Falls. Twelve new combers have been installed in the Salmon Falls Cotton Mills.

New Jersey, Clifton. After May 1 the Yazoo Mills, Inc., will occupy their new mill at this place. The new plant is fully equipped for converting and dyeing all classes of twines and yarns. The New York office will be at 99 Warren St.

*North Carolina, Greensboro. The Revolution Cotton Mills have installed one of the latest improved filtration plants built by Hungerford & Terry, Penna. Bldg., 15th and Chestnut Sts., Philadelphia.

North Carolina, Jonesboro. A new company to be known as the Leeco Cotton Mill Co. has been organized, and acquired the Clark Mfg. Co.'s property. It is reported the capacity will be increased one-third, and electricity adopted for power. D. E. McIver of Sanford, North Carolina, is president; G. W. Huntley of Wadesboro, North Carolina, vice president; J. R. Jones of Sanford, secretary and treasurer; and John Kennedy of this place, superintendent.

North Carolina, Rutherfordton. It is reported that the present equipment of the Levi Cotton Mills Co. will be doubled. At present they have

6,480 ring spindles and 3,200 twisting spindles. Last August this property was purchased by J. R. Gillian of Lynchburg, Va., for $58,000.

Pennsylvania, Philadelphia. Whiteley & Collier, 55th and Girard Ave., have increased their weaving capacity by an addition of 6 new looms.

*Rhode Island, Ashton. Additions to the Ashton Mills of the Lonsdale Co. consist of the erection of an addition to the mill, 120 ft. long, 90 ft. wide, and 2 stories in height. The new space will be filled with looms. The company has also decided to replace the old looms with modern Northrop looms. When improvements are completed the weaving department will contain 1,024 looms. Construction work will be done by J. W. Bishop Co.

Rhode Island, Centreville. The Warwick Mills are adding 106 new Crompton & Knowles looms. Recently the employes received an increase in wages amounting to about 20 per cent.

*Rhode Island, Pawtucket. Contracts for building the two large mills for the Royal Weaving Co., at Darlington, have been awarded. The estimated cost of the mills is $250,000.

*South Carolina, Chester. Leroy Springs, president of the Eureka Cotton Mills, has awarded contract to J. A. Jones of Charlotte, North Carolina, for the erection of the proposed addition to this plant. He has also awarded contract for machinery to be installed, including 8,000 spindles and 450 looms.

South Carolina, Greenwood. The installation of 9,000 spindles in No. 1 mill of the Greenwood Cotton Mills has begun.

*South Carolina, Greer. The reported installation of 400 dobby heads on plain looms in the Victor Mfg. Co.'s plant will be completed during the coming summer.

*South Carolina, Rock Hill. Additions to the Hamilton Carhartt Cotton Mills will be the proposed 140 by 140 foot addition reported last week. They will install 400 looms. R. C. Bibberstein of Charlotte, N. C., will be the architect engineer in charge.

South Carolina, Union. It is expected that 6 cards and 50 looms will be added to the Otteray Mills, formerly known as the Aetna Cotton Mills, which were recently purchased by Lewis W. Parker and associates, as reported.

*Texas, Bonham. Reported enlargements at the Bonham Cotton Mills will include the erection of an addition to the present buildings.

*Virginia, Danville. Proposals will soon be invited for the construction of buildings for the additional 45,000 spindles and 1,500 looms, announced in March, to be added to the Dan River Power & Mfg. Co. The main structure is to be 550 by 150 ft., 3 stories high, and cloth room, 5 stories high, 220 by 75.

Mills Shutting Down.

Maryland, Franklinville. After an idleness of several years the Franklinville Duck Mills, owned by the Consolidated Cotton Duck Co., have been started up.

WOOLEN.

New Mills.

*Massachusetts, Lowell. The new worsted plant being equipped by Mark Ingham, agent of the Moore Spinning Co., North Chelmsford, will be known as the Allerton Worsted Mills. 3,000 spindles will be installed for spinning 60s and below on the Bradford system. Manufacturing will be started about June 1 under the management of Edward Hoyle. Mr. Ingham will remain in charge of the Moore Spinning Co.

*Oregon, Pendleton. Arrangements have been completed by Clarence Bishop for the erection of a railroad concrete building to cost $45,000, in which woolen mill machinery, which has been purchased by him as reported, will be installed.

Pennsylvania, Philadelphia. N. K. Regar, formerly of the firm of Regar & Oughton, recently reported by us as having dissolved partnership, is removing his machinery to Coral St. and E. Boston Ave., where he has leased the building formerly occupied by the N. Spencer Turner Co. as a woolen yarn spinning plant. Mr. Regar will operate his business under the name of the N. K. Regar Manufacturing Co., manufacturing worsted goods on 25 broad looms, and sell his production direct. He will use 12/1 and 40/2 French and Bradford spun worsted yarns.

*Pennsylvania, Philadelphia. The Windsor Manufacturing Co., recently reported by us as asking for a charter, will have a capital of about $50,000 and commence its operations at 4060 Orchard St., where they will operate 40 broad looms on worsted men's wear. Mr. Oughton, formerly connected with the firm of Regar & Oughton, will be a member of the new company which will start up its plant about May 1.

*Tennessee, Lebanon. William A. Fell of Detroit, Mich., has been engaged to be superintendent of the new Labanon Woolen Mills. Preparations are being made to build a factory which will be of stone, brick, and steel construction, 2 stories high, 72 by 174 ft., with annex, 40 by 50 ft., for boiler room and wet finishing. They will manufacture woolen blankets exclusively, and expect to install the best equipment obtainable. As reported previously there will be 2 sets 60-inch cards, 1,440 spindles, 30 broad looms. Later on they expect to add 2 more sets of cards and double the equipment. The plant will be operated by electric power. H. K. Edgerton is president; E. E. Beard, vice president; and H. M. Freeman, general manager.

Enlargements and Improvements.

Connecticut, Baltic. Ten new looms have been set up in the new building of the Shetucket Worsted Mills, M. H. Donahoe, proprietor. This new building was completed several months ago, and will be known as Mill No. 2. Men's wear worsteds will be manufactured. Additional machinery will be installed from time to time.

Connecticut, Rockville. A new building, 180 by 50 ft., will be erected on the land adjoining the present plant of the Rock Mfg. Co. The new space will be used as a finishing and carbonizing department. Construction work was started April 1.

*Connecticut, Rockville. Following the sale of Mills 2 and 4 of the J. J. Regan Mfg. Co. to the Belding Bros. Co. it is reported that the former company will increase its woolen and knit goods departments from 25 to 33 per cent. All of the woolen machinery will be removed to the new mill recently constructed.

*Connecticut, Rockville. Two sets of cards and four looms are to be added to the equipment of the Minterburn Mills Co. This covers the reported enlargement.

Iowa, Davenport. Improvements are being made to the plant of the Davenport Woolen Mills Co., and it is understood that the machinery equipment will be increased.

Maine, Sanford. An additional story is being built on one of the Goodall Worsted Co.'s mills. The new space will be used for burling.

*Massachusetts, Blackinton. Construction work has been started on the new weave shed for the Blackinton Mfg. Co. The building will be 220 ft. long and 63 ft. wide. A new concrete dam also will be built.

*Massachusetts, Haverhill. About four or five months will be required for the erection of the new 270 by 120 ft. weave shed under construction for M. T. Stevens & Sons Co. Looms will be moved from the present mills, but there will be space for some additional looms.

Massachusetts, Lawrence. Foundations are nearly completed for the three new buildings for Walworth Bros. The main addition will be 125 ft. in length, 60 ft. wide, and 2 stories high. The second building, which will be a dye house, will be 50 by 50 ft., 1 story high; the third building will be 100 by 50 ft.

*Massachusetts, Lawrence. At a special meeting of stockholders of the Arlington Mills, held April 7, it was voted to increase the capital stock from $6,000,000 to $8,000,000 by issuing 20,000 additional shares. The new stock is to be paid for in two installments, one-half October 16, 1909, and the balance January 15, 1910. As reported previously a large worsted yarn mill will be constructed, and already tenants occupying buildings on the proposed site of the new mill have been notified to vacate May 1. Dimensions given previously are substantially correct.

*Massachusetts, Lowell. Everything has been arranged for the enlargement of the Lyon Carpet Co. An addition will be built, and 20 new looms installed. Contracts have been given out.

Massachusetts, Millbury. Sixteen looms in the Mayo Woolen Co.'s plant will be started on worsted goods.

Massachusetts, North Andover. Plans are in progress for changing the Osgood Mills, owned and operated by M. T. Stevens & Sons Co. from a woolen plant to a worsted plant. The wool sorting and picking departments have been discontinued, and it is expected that the carding and spinning rooms will be stopped shortly. The cards and mules will be replaced by worsted machinery. Ground has been broken for a new power plant, which will have boiler and engine rooms and coal pocket. The changes will be completed as soon as possible.

*Massachusetts, North Andover. E. A. Peabody & Son have begun work on the new mill for the Brightwood Mfg. Co. Particulars of this enlargement have been given.

Massachusetts, Plymouth. Another enlargement will be built to the plant of George Mabbett & Sons Co., 30 by 115 ft. New space will be used to enlarge the finishing department.

*Massachusetts, Saugus. The United States Worsted Co. has purchased the Musketaquid Mill, Lowell, Mass., and the Saugus Mfg. Co. As reported previously, they are increasing the capacity of both plants. Eventually they will operate in the neighborhood of 8,000 to 10,000 looms. The officers are Charles M. Kahn, president; Ivar L. Sjostrom, vice president; P. R. G. Sjostrom, secretary and treasurer; Samuel Jolesch, sales manager; Edwin J. Hylan, manufacturing agent.

*Massachusetts, Uxbridge. Plans have not been definitely settled in regard to the Scott Mill, recently taken over by the Uxbridge Worsted Co. They plan to run the Scott Mill just as it is, and the addition recently reported will be for the Uxbridge Worsted Co. It is probable the new building will be two stories high.

New Jersey, Trenton. Enlargements are being built to the worsted department of F. A. Straus & Co.

New York, Amsterdam. Two stories will be added to Mill No. 4 of Shuttleworth Bros. Co. The new space will be used for storage purposes.

New York, Waterloo. A worsted department is being established in the Waterloo Woolen Mfg. Co.'s plant, and machinery is now being installed.

Ohio, Ashtabula. A new weave shed will be built for the Ashtabula Worsted Mills, and the present weave rooms combined.

*Ohio, Piqua. Construction work will be started immediately on the new building for the Orr Felt & Blanket Co., and it is expected that it will be completed by January, 1910. The new structure will occupy practically a block. The present equipment of this company will be moved into the new building and operated by electric power. New machinery has not yet been ordered.

*Ohio, St. Mary's. Nine new looms will be installed in the addition being built for the St. Mary's Woolen Mfg. Co., and they expect to be producing goods by July 1. This will give a total of 4 sets of cards and 40 looms. Fine blankets are manufactured.

Pennsylvania, Bloomsburg. Contract has been

awarded by the Magee Carpet Co. for a 3 story dye house, 60 by 120 ft.

*Pennsylvania, Chester. The new 2-story brick addition, 60 by 60 ft., which will be erected for the Emmott Worsted Spinning Co., will be used for spinning, twisting, and wool room. One card and 700 spindles will be installed. The enlargement will be completed about June.

Pennsylvania, Philadelphia. Archibald Holmes & Son, Allegheny Ave. and A St., have recently installed 4 broad looms on which they are manufacturing rugs in addition to the ingrains which they have been making for some time. They are now buying 14s to 18s cotton and the same numbers in worsted yarns.

Pennsylvania, Philadelphia. The Lion Yarn Co., located in the Callaghan Mills at 60th St. and Baltimore Ave., report that they are running up to their fullest capacity on worsted yarns (Bradford system) for weaving and knitting. They have recently taken over more space in the mill and are now occupying almost the entire Baltimore Ave. mill.

Pennsylvania, Philadelphia. The Cheefoo Mills Co., 2739 N. Fairhill St., are having erected a new engine and boiler house, one story, of brick, in which they are installing a new 100 horsepower boiler, and will put in a 75 horsepower engine.

Pennsylvania, Philadelphia. Greaves Brothers, Jasper and Huntingdon Sts., manufacturers of dress goods and men's wear, have increased their weaving capacity to 109 looms, all of which are running full time.

Pennsylvania, Philadelphia. Folwell Bros. & Co., 3d and Cambria Sts., have recently taken out their woolen spinning department, consisting of 8 sets, 6,400 mule spindles, and have increased their worsted spinning department to 11,680 spinning and 3,998 twisting spindles.

Pennsylvania, Philadelphia. A contract has been given out by William Ayres & Sons, Third and Cumberland Sts., manufacturers of horse blankets, for the erection of a boiler house and concrete tank, at a cost of $15,000.

Pennsylvania, Philadelphia. Bush & Terry, since the removal of the sub-tenants on the top floor of the mill at Jasper and Thayer Sts., have taken in the whole building and installed 53 additional looms and are now operating 64 looms on art squares and axminster rugs, selling the product through their own offices in the Hartford Bldg., New York.

Pennsylvania, Philadelphia. Jenny & Stott, 1121 E. Chelton Ave., Germantown, commission weavers, men's wear, who have been operating 14 narrow looms, have put in an addition of 10 more looms and report business as exceedingly good.

Pennsylvania, Philadelphia. The Germantown Worsted Mills, operated by R. Kennedy at 240 Ashmead St., are arranging for the installation of 10 new broad looms.

Pennsylvania, Philadelphia. The factory building at the N. E. corner of 7th and Huntingdon Sts., formerly occupied by W. W. Keefer, and which was recently sold at bankrupt sale, has been sold to the Ivins, Dietz & Metzger Co., who are the owners of adjoining buildings. The purchase price is said to have been $52,000 and includes a two-story factory, one story dye house and one story boiler and engine house, on a lot 164 feet, 4 inches by 105 feet, and is assessed at $25,000. The new owners are having plans prepared for a new five-story building of fireproof construction to cover the entire lot and will cost about $250,000, including equipment. The operation will be started as soon as the old buildings have been demolished.

Pennsylvania, Philadelphia. The Shetland Worsted Mills, Haines St. and Stenton Ave., Germantown, report that they are very busy and have recently installed a complete plant for dry finishing purposes.

Rhode Island, Wakefield. A new boiler and engine will be installed in the Wakefield Mfg. Co.'s plant, necessitating a shut down of about ten days.

Rhode Island, Woonsocket. Construction work has been started on the proposed new mill for the Lafayette Worsted Co. New building is to be a duplicate of the main building now occupied, and will be 4 stories high, 109 by 174 ft. It will be completed in five months and will be equipped with machinery for spinning worsted yarns on the French system.

*Rhode Island, Woonsocket. Machinery has arrived for the new mill recently completed for the Lowland Worsted Co.

Rhode Island, Woonsocket. Plans have been completed for the proposed addition to the Perseverance Worsted Co., which call for a two-story building, 50 by 100 feet, to be erected on the southeast side of the present structure. Construction work will be started as soon as possible. The new building will be used for a finishing department.

*Rhode Island, Woonsocket. The J. W. Bishop Co., of Worcester, has been awarded contract to erect the new mill of the French Worsted Co. The combing mill will be 150 by 60 ft., 2 stories high; the storage building, 180 by 66 ft., 1 story high; and the machine shop, 116 by 36 ft. Construction work will be started at once, and it is hoped to have the new buildings ready for occupancy by fall.

Mills Starting Up.

Illinois, Ipava. The Ipava Woolen Mills have been incorporated with capital stock of $10,000 to manufacture woolen blankets and to operate an electrical plant. The new company will take over the Ipava Woolen Mills plant at Ipava, formerly operated by C. F. Foote. S. A. Drake, W. D. Myers, and T. H. Greer are the incorporators. Mr. Greer is a member of the firm of Scripps-Greer Dry Goods Co., of Canton, Ill., and bought the Ipava Woolen Mills property last October for $5,000. All communications should be addressed

to Canton. The mill is in operation under the management of C. Marshall.

Mills Shutting Down.

Connecticut, Norwich. A shutdown of two weeks has been entered upon by the Glen Woolen Mills.

Pennsylvania, Philadelphia. David Brown & Son's Coaquanock Mill at 69 Haverford Ave. has been shut down for the past three weeks. The plant will not be started up again until sufficient orders have been received to keep it running on a profitable basis.

Pennsylvania, Philadelphia. Newbold & Co., 1832-26 E. Clearfield St., manufacturers of jute and wool Smyrna carpets on 65 broad and 18 narrow looms, have shut down their plant and it is reported will not start it up again, but will place it on the market for sale.

SILK.

New Mills.

*Connecticut, Norwich. The Norwich Silk Co., previously reported incorporated with capital stock of $10,000, will manufacture thread, twine, braid, and knit goods.

*New Jersey, Paterson. The Rigby Silk Co., incorporated in February, have started manufacturing on the ground floor of the Slater Mill, corner of Dale and Slater Sts. The plant is operated by electric power and the product is sold through A. H. Eastmond & Co., 473 Broome St., New York.

New Jersey, Phillipsburg. A new silk company has been formed under the style of the Phillipsburg Silk Co., and has leased the building formerly used as a machine shop by the Lackawanna R. R. and machinery will be installed at once. Charles S. Brady is at the head of the new corporation. The capital stock is $125,000.

Pennsylvania, Allentown. The Ansonia Silk Co. is a new silk company managed by Charles Saperstein, formerly with the Stuyvesant Silk Co. of this place, which occupies the fourth floor of the Christ Peter & Co.'s building at Hall and Maple Sts. They will operate a number of broad looms on silk goods in about six weeks.

*Pennsylania, Spring City. Silk ribbons will be manufactured in the building formerly occupied by W. C. Urner & Co. by a combination of silk mills known as the United Textile Corporation comprising John S. Mack, president of the Providence Silk Co., of Scranton; William R. Yeager, president of the Unity Silk Co., of Allentown; Thomas H. Kinney, president of the Queen Silk Co., Allentown; John A. McCollom, treasurer of the Lecha Silk Co., Allentown; and Leo. E. Schimpff, president of the Joseph S. Mack Silk Co., Allentown.

*Pennsylvania, Wilkesbarre. Construction work has been started on buildings for the Leon-Ferenbach Silk Co. A full report of this company has been given.

Rhode Island, Central Falls. The Seminole Mfg. Co. has been incorporated with capital stock of $100,000 by Ernest H. Behrens, Emanuel Weill and Harold C. Barnefield. It is stated that they will manufacture silk, wool, cotton and other fabrics. A plant will be erected near the Waypoyset Mfg. Co.'s plant. In a previous report it was stated that E. H. Barnes Co. would erect a mill. This should have read E. H. Behrens. Mr. Barnefield is treasurer of the Waypoyset Mfg. Co. and Mr. Behrens is of the firm of E. H. Behrens & Co., 33-35 Greene St., New York.

*Rhode Island, Pawtucket. The capital stock of the Tamarack Co., which was incorporated last November under Rhode Island laws with capital stock of $100,000, has been increased to $200,000, fully paid in. They have just started to erect a new building, 2 stories high, on Barton St. The structure will be 197 ft. long, and 159 ft. wide. The concern will install, as soon as the building is completed, additional looms to bring the equipment up to 250. For about 5 months the concern has been operating 70 looms in quarters leased of the Jenckes Spinning Co. and making silk and satin linings and silk dress goods. The officers are as follows: J. E. Jenckes, president; F. L. Jenckes, treasurer; R. J. Jenckes, secretary; W. P. Wood, agent.

Enlargements and Improvements.

New Jersey, Phillipsburg. Construction work has been started on a new reinforced concrete building, 71 by 74 ft., 2 stories high, for the Mauchline-Firth Silk Co. Thirty looms will be installed and this number will be gradually increased.

New York, Binghamton. The Binghamton Silk Mills have been taken over by the Rossville Silk Mills Co., recently reported incorporated. It is understood that the present capacity of 100 broad looms on broad silks will be increased. William H. Boydell is superintendent.

Pennsylvania, East Greenville. The Imperial Ribbon Co. has been incorporated with capital stock of $24,000 to take over the business of the same name conducted by A. Schultz, manufacturer of silk ribbons. The plant will be enlarged and output increased to double the present amount. They will begin at once to build an addition. This will be equipped with a few hundred spindles and several new looms.

Pennsylvania, Jersey Shore. The Susquehanna Silk Mills, Sunbury, Pa., have purchased a mill at this place and will begin manufacturing at an early date.

MISCELLANEOUS.

Connecticut, East Killingly. Associated with George K. Moore of Providence, Rhode Island, in the proposed printing and finishing company, are John Hope, Jr., formerly of the Hope Mfg. Co., and Richard T. Keene of Central Falls. These men have purchased the plant formerly owned by the United Machine & Tool Co., and will incorporate probably under the name of the Hope Print

Works. John Hope, Jr., will be general manager. It is stated that the intention of the new company is to convert cotton prints for export, and to do a roll engraving and finishing and bleaching business for the trade. The capital stock will be $200,000, of which $100,000 has been subscribed. Seven printing machines have been installed.

*Connecticut, East Killingly. As reported probable in a previous issue the Whitestone Co. will occupy the mill to be vacated by M. H. Marcus & Bro. The Whitestone Co. will do a bleaching, dyeing and finishing business. William E. Whittle is one of the incorporators.

Massachusetts, Easthampton. It is probable that the directors of the Glendale Elastic Fabrics Co. will decide to build a large addition.

*Massachusetts, Easthampton. A permit has been received by the Glendale Elastic Fabrics Co. to build two additions to their mill. One addition will be to enlarge the weaving department, and the other to provide more space for finishing.

*Massachusetts, Holyoke. About 5,000 square feet have been added to the manufacutring space of the Bullard Thread Co. This will give space for additional machinery which will increase the output nearly 100 per cent. They are converters of thread only.

*Massachusetts, Rockland. At a meeting of the stockholders of the Rockland Webbing Co. it was voted to make the proposed increase in capital stock from $20,000 to $50,000, and build a two-story addition, 70 by 52 ft., on the west side of the present plant. Chester A. Woodward was elected president and George A. Woodward, treasurer.

Massachusetts, Waltham. Permit has been issued to the Waltham Bleachery & Dye Works to build an addition to the building on River St. The enlargement will be 122 ft. in length, 72 ft. wide, and 3 stories in height.

*New Jersey, Hillsdale. It is probable that the new Hillsdale Bleaching Co., recently incorporated with capital stock of $50,000 as noted under Paterson, will be located at this place, although no statement has been given out by the company.

New Jersey, Lodi. The United Piece Dye Works, dyers and finishers of silk and silk mixed piece goods, who are making extensive additions to their plant in the way of installing new boilers and pumps, have also installed a filter plant supplied by Hungerford & Terry, filtration engineers in the Penna. Building, 15th and Chestnut Sts., Philadelphia, with a capacity of 1,000,000 gallons per day.

*North Carolina, Charlotte. The Cotton Fiber Co., recently reported incorporated with capital stock of $125,000, will erect a 2-story building, 40 by 80 ft. and install machinery for manufacturing cotton mill waste. The product will be recleaned and sold as fiber. This company has organized with C. O. Brown, president; John R. McDonald, vice president; R. K. Blair, secretary, treasurer and general manager.

Pennsylvania, Griesemersville. A mill is being erected for the Lehigh Bleaching & Dyeing Co., by O. S. Hoch of Allentown. The building will be 26 by 180 ft., and will be ready for manufacturing on May 1. On April 12 a charter will be asked for by Oliver H., James T. C., and Erwin A. Krasley. These men were formerly connected with the Acme Bleaching & Dyeing Co., of Allentown, Pennsylvania. A general bleaching and dyeing business will be done.

*Pennsylvania, Philadelphia. The Krout & Fite Manufacturing Co., located on Emerald St., below Lehigh Ave., whose building is being enlarged by the erection of another story, it is reported will add additional looms and also equip their plant throughout with individual motors. They are manufacturers of bindings, narrow fabrics and tapes.

Pennsylvania, Philadelphia. Messrs. Schweigart Bros., who are operating the American Dye Works at Tioga and Aramingo Sts., report that they are about to remove their plant to a new building which is under course of erection at Westmoreland and Phillip Sts. The new building will be one story, of brick, 46 by 100 ft., with an additional building for use as a boiler and engine house. After their removal to their new address they will operate under the name of John Schweigart's Sons, dyeing cotton and woolen skein yarns, with Albert Schweigart as superintendent.

Pennsylvania, Philadelphia. The Fairhill Bleachery, Emerald and Westmoreland Sts., have increased their equipment and are now able to bleach 3,000 lbs. of skein yarns and tapes per day. For the past four weeks they have been running day and night.

Pennsylvania, Philadelphia. The York Finishing Works, of which Scheiter & Snyder are the proprietors, located at Jasper and York Sts., who have been finishing cotton goods and hair cloth, are arranging for the installation of machinery for the finishing of silk goods as an addition to their regular line.

Pennsylvania, Philadelphia. The Estate of Thomas Johnson, printers of hosiery bands and labels at 6th and Huntingdon Sts., have erected a new building at Lawrence, Clearfield and Orkney Sts., into which they expect to remove about the 1st of June next. The building is two stories and basement of brick and stone, 35 by 85 feet. In their new quarters they will also put in additional machinery.

Pennsylvania, Philadelphia. The Philadelphia Tapestry Mills, Allegheny Ave. and Front St., are building a large 6-story and basement extension to their present mill. This addition, in conjunction with the 6th floor of their present mill, which is now occupied by the William Brown Co., manufacturers of full fashioned hosiery, whose lease expires July 1, they will fill up with new looms the number of which at this time they cannot state. They are manufacturers of upholstery fabrics on 250 looms, selling direct.

Pennsylvania, Reading. The addition under construction for the Reading Dyeing Co. will be 120 by 40 ft., of brick construction. The new

space is intended for cop and cone dyeing and bleaching of cotton and worsted yarns. Max Thus is president and superintendent.

*Rhode Island, Saylesville. All contracts for enlarging the Glenlyon Dye Works have been awarded.

*Rhode Island, Woonsocket. The Rhode Island Dyeing & Finishing Co. will be liquidated as the result of the unwillingness of its stockholders to put in money necessary to make improvements or to build a new mill. A meeting will be held within a few days with the idea of winding up the business. Nearly all the local plant is shut down at present, and as reported previously, the branch plant at East Brookfield, Mass., has been discontinued.

FAILURES AND SUSPENSIONS.

Massachusetts, Worcester. Announcement has been made that the Wachusett Mills, formerly manufacturers of towels, have made an assignment for the benefit of creditors. C. M. Thayer is the assignee. While no schedule has been filed, it is understood that the liabilities of the company are about $50,000. Its real estate is assessed at $35,000. Since January, 1908, the property has been occupied by the Greenwood Mills, which removed here from Passaic, N. J.

North Carolina. D. E. McIver has been appointed trustee for the Cameron Mills, which have made an assignment, after being idle several months. The liabilities are said to be $20,000, and it is reported the property will be sold.

Pennsylvania, Philadelphia. Ellen Newbold, individually and as surviving partner of Wistar Newbold and Ellen Newbold, trading as Newbold & Co., manufacturers of Smyrna rugs at 1832-36 E. Clearfield St., has been adjudged an involuntary bankrupt. The plant contains 19 narrow looms and has been shut down for several weeks.

*Pennsylvania, Philadelphia. James C. Grant, trading as Henry Grant & Sons, manufacturers of woolen and merino yarns on four sets at 3d and Somerset Sts., has been adjudged an involuntary bankrupt. The plant, as recently reported, will be sold out at public auction the middle of this month.

FIRES.

Massachusetts, Bellingham. The Red Mill property of the Norfolk Woolen Co., Franklin, Mass., has suffered loss of $5,000 by fire, caused by an overheated bearing. This plant was used for the manufacture of shoddy. The company has not decided regarding rebuilding.

New York, Amsterdam. A frame storehouse, used by A. V. Morris & Sons, on River St., has been destroyed by fire. The loss is estimated at $3,000.

North Carolina, Graham. Loss of about $7,000, fully covered by insurance, was caused by fire in Oneida Cotton Mills.

Pennsylvania, South Bethlehem. The dyeing department of the Austin Knitting Co. has been destroyed by fire with loss of $5,000, and the knitting mills have been slightly damaged. The dye house will be rebuilt at once and run night and day in order to catch up with overdue orders. The knitting department resumed manufacturing April 21. J. H. LeConey is agent and buyer.

FACTS AND GOSSIP.

Alabama, Sylacauga. T. J. Mathews, president of the Marble City Mills, has sold his stock in the corporation to D. M. Lewis. J. W. Brown has been appointed manager. Hosiery yarns are manufactured on 5000 spindles.

Canada, Ontario, Toronto. The business of the Merchant's Dyeing & Finishing Co., Ltd., has been purchased by the Canadian Dyer's Association, Ltd., who will do a business of dyeing and finishing dress goods for Canadian mills, also for imported goods of British or foreign origin. A. Burton is president and E. S. Burton is secretary and treasurer. The plant is located at 2-6 Liberty St.

Connecticut, East Killingly. M. H. Marcus & Bro. will remove to Nepara Park, New York, at the expiration of their lease. The building now occupied by them will be sold to other parties. Rumor states that it will be bought by the Whitestone Co., recently incorporated, as reported in another part of this issue.

Connecticut, Putnam. The Hampton Silk Co. has been incorporated with capital stock of $25,000, $10,000 paid in. The incorporators are Charles C. Knowlton of Brooklyn, Samuel Rich, L. E. Law, Oscar S. Rich, and George Hammond of Putnam.

Georgia, Eatonton. John Cannon of Concord, North Carolina, has bought the Middle Georgia Cotton Mills, and it is reported will enlarge the plant. Six thousand ring spindles, 175 broad looms, and 40 narrow looms were operated on ducks. A receiver was appointed for the Middle Georgia Cotton Mills in April, 1908, and the plant has been idle since that date.

Maine, Corinna. T. F. Burrill has purchased the mill of Charles A. Greenwood and is putting the plant in shape for starting up. Three sets and 20 looms were operated on cotton warp cassimeres.

Maine, Waterville. Joseph Noone's Sons Co., of Peterboro, N. H., are operating some of the machinery in the Chase Mfg. Co.'s old plant on woolen yarns. They operate under the style of the National Woolen Co.

*Maryland, Dickeyville. The Ashland Mfg. Co. has been incorporated with capital stock of $250,000 by Jacob Noll, George A. McCauley, and Henry H. Hubner. This is a reorganization of the Ashland Mfg. Co., which it was reported some weeks ago would take place.

Massachusetts, Fall River. The Algonquin Printing Co. has bought a tract of land on Bay St., and it is reported intends to erect a print cloth mill of about 50,000 spindles. Other reports

state that the land was bought to protect the company's water rights, and that there is no intention of building mill. In earlier reports it was stated that Edward B. Jennings would be treasurer of the new mill.

*Massachusetts, Fall River. At the regular meeting of the directors of the Arkwright Mills the project to build a new mill was discussed, but no action was taken. The plan is to double the capital stock, now $450,000.

Massachusetts, Fitchburg. It has been decided to secure a competent manufacturer to operate the Houghton Web Co.'s plant on a profitable basis. The plant is now shut down.

Massachusetts, Hancock. It is reported that a firm of silk manufacturers is in correspondence with John Taylor of this place negotiating for the purchase of water privileges with a view to locating a silk mill here.

Massachusetts, Holyoke. Reports to the effect that a building would be erected for the Howard Ramie Fibre Co., some of which even gave dimensions, are premature, as Thomas Stansfield, secretary of the Holyoke Business Men's Association, which has the matter in charge, advises that nothing definite has been decided upon.

Massachusetts, North Adams. The following permanent board of directors of the Arnold Print Works has been elected: Robert F. Herrick, president; James Thomson, treasurer; N. C. Barnhart, Simeon B. Chase, W. Murray Crane, W. A. Gallup, A. C. Houghton, Charles W. Jones, and Edwin C. Merrill.

Michigan, Detroit. The Thistle Dye Works Co., 276 Jos. Campaw Ave., are offering their plant for sale.

New Hampshire, Hinsdale. James O'Brien, W. N. Pike, C. E. Keyore, V. S. Smith, H. W. Taylor, N. O. Maynard and George A. Robertson have bought the real estate and water power privilege of the Haile & Frost Mfg. Co. for $18,000. They bought the property for an investment and will sell or rent to small industries. It is probable the buildings and power plant will be repaired.

New Jersey, Hohokus. Only one bid was received for the Brookdale Bleachery at the recent sale, and as that was unsatisfactory it was rejected by the creditors. The Western Shade Cloth Co. was the one bidder and made an offer of $60,250. The value of the property is placed at $150,000.

New Jersey, Jersey City. The American Bleach Goods Co. has been incorporated to manufacture textile fabrics by Edmund S. Twining, with Clarence Whitman & Co., 39 Leonard St., New York, Wm. F. Adams, Summit, New Jersey, and Charles Twining, Newark, New Jersey. No statement will be given at present regarding this corporation.

New Jersey, Newark. Charter has been granted the Conecuh Cotton Mills with capital stock of $200,000. Irving T. Hunter, A. Brice Crane, and Beatrice V. Bicknell are the incorporators. The object is given to operate cotton mills.

New Jersey, Newark. The Espy Cotton Co. has been incorporated with capital stock of $50,000 by Carl Espy, Herbert L. Thowles, and Fred G. Stickel, Jr.

New Jersey, Paterson. Reports that the Weidmann Silk Dyeing Co. had sold its plant to Gilette & Sons of Lyons, France, are incorrect, as only a small interest in the business has been sold to a member of the latter firm. This company recently installed another Hungerford & Terry filter, with capacity of 600,000 gallons per day.

New Jersey, Paterson. The plant and business of the Eureka Silk Dyeing Co. has been acquired by John Walton, Jr., formerly treasurer of the company. Dr. Gordon Walton, and A. J. Samuels. John Walton, Jr., will be general manager. It is planned to make extensive alterations in order to increase the present capacity of the plant.

*New Jersey, Paterson. The purchasers of A. & M. Levy's plant, River and Bridge Sts., are Samuel J. Ronshein and Benjamin Bangser, jobbers, with offices at 31 Union Square, New York. They state that arrangements have not been completed in regard to the property. The purchase price is $45,000.

Pennsylvania, Philadelphia. Clayton L. Hagy, Jr., Henry J. Fitmaurice, Joseph Nerlinger, Geo. W. Jacobs, Jr., and Ethel McK. Hagy, have asked for a charter for Clayton L. Hagy & Son, incorporated. They operate a plant for the manufacture of cotton and woolen waste at 16th and Carpenter Sts.

Pennsylvania, Philadelphia. Since the death of Joseph T. Smith, the spinning mill operated by him, consisting of 3,000 spindles, Bradford system, has been taken over by A. S. Cameron & Co., who are operating under the name of the Harrowgate Spinning Mill. P. J. Moroney is superintendent. The plant is located at Emerald and West Moreland Sts.

Pennsylvania, Philadelphia. Francis E. Bruner, now at 1928-30 Boston Ave., where he manufactures upholstery goods on six looms, is arranging for the removal of his plant to the one-story building in the rear of E. Boston Ave. and Coral St.

Pennsylvania, Philadelphia. A charter has recently been granted to the New Castle Manufacturing Co. with a capital of $300,000. The company is now organizing with prominent men of this city among its directors. They will manufacture yarns, but at this time cannot give the mill's equipment or where it will be located.

Pennsylvania, Philadelphia. The United Mills Manufacturing Co., recently reported by other journals as starting a large plant at 2452 Jasper St., for the manufacture of rugs, carpets, blankets, curtains and Brussels carpets, has been in existence for some time. This is the trade name under which Jas. & Geo. D. Bromley, Jasper and Adams Sts., have been advertising and selling direct to the consumer for some time past.

Pennsylvania, Philadelphia. The Kensington Burling Co., Irvine Carr, manager, has leased the two-story building at Lippincott and E Sts., where they are burling and mending textile fabrics of all kinds.

Personals.

Wm. E. Helliwell succeeds James P. Barnes as designer at the Washington Mills, Lawrence,

Herbert Taft, for many years master mechanic at the Oakland Worsted Company, Oakland, R. I., has severed his connection with that company.

Albert E. Brooks, overseer of the cloth department at the Troy Cotton & Woolen Mfg. Company, Fall River, Mass., has resigned to accept a position with the E. P. Charlton Company.

Frederick Berkenshaw, overseer of finishing at the Pontoosuc Woolen Mfg. Company, Pittsfield, Mass., was given a complimentary banquet at Hotel Wendell in that city on resigning his position which he has held with that company.

A. W. Gibson has accepted a position as overseer of carding at the H. T. Murdock & Company's mill at Proctorsville, Vt. Mr. Gibson formerly held this position.

John Convery has been appointed superintendent of the Montreal Cotton Company, Valleyfield, Que., Canada. For the past three years he has held the position as overseer of the bleaching and dyeing department.

Frank Hartley, superintendent of the cambric department of S. Slater & Sons, East Webster, Mass., has severed his connection with that company.

Jos. S. Jeffries, of the weaving department at the Wood Worsted Mills, Lawrence, Mass., has severed his connection to accept a position at the Beoli Mills, Fitchburg, Mass., it is reported in charge of the weaving department.

Edmond Griffin, overseer of the dyeing department at the Dunn Worsted Mills, Woonsocket, R. I., has been promoted to the position of assistant superintendent to succeed Wm. D. Dunn. The position as boss dyer is to be filled by the promotion of Wm. F. Himes, who has been employed at the Dunn Worsted Mills a number of years.

Wm. D. Mann, for the past sixteen years superintendent of the American Felt Company, City Mills, Norfolk, Mass., has resigned to accept a similar position with the same company's mill at Franklin, Mass., succeeding John L. Morse. Mr. Mann was presented with a gold watch, charm and chain with Masonic emblem and a pair of gold cuff links, the gift being tendered as a mark of good will, friendship and best wishes for his future success by the overseers who were formerly under his employ.

John L. Morse, for several years superintendent of the American Felt Company, Franklin Mill, Franklin, Mass., has resigned and is to retire from active mill life.

H. L. Henries has accepted a position as overseer of finishing at the Pontoosuc Woolen Mfg. Company, Pittsfield, Mass. He was formerly employed at the Montrose Woolen Company, Woonsocket, R. I.

R. A. Whatley, overseer of weaving at the Fulton Bag & Cotton Mills, Atlanta, Ga., has accepted a similar position with the Pepperton Mills, Jackson, Ga.

E. A. Robinson, overseer of the cloth department at the Washington Mills, Fryes, Va., has accepted a position with the Bonham Cotton Mills, Bonham, Tex.

W. B. Kilholen has accepted a position as overseer of carding at the Erwin Cotton Mills Company, Cooleemee, N. C., succeeding W. G. Reynolds, who resigned.

B. F. McClure, overseer of the spinning department at the Seneca Cotton Mills, Seneca, S. C., has been promoted to the position of superintendent, succeeding J. T. Kersey, who resigned.

E. C. Poe has accepted a position as overseer of weaving at the Royall Mills, Wake Forest, N. C., succeeding John A. Davis.

G. D. Pryor, overseer of spinning at the Clifton Mfg. Company, Clifton, S. C., has resigned.

H. M. Meehan has been appointed assistant superintendent of the Seminole Mfg. Company, Clearwater, S. C. He comes from Denver, Colo.

E. J. Lynch has taken charge of the cloth department at the Central Mills, Griffin, Ga.

L. G. Stephenson has been appointed superintendent of the Whitley Mfg. Company, Wendell, N. C. He was formerly employed at the Morgan Mills, Laurel Hill, N. C.

O. F. Veal has accepted a position as overseer of carding at the Manchester Mills, Macon, Ga.

Geo. Stanton has been appointed superintendent of the Manchester Mills, Macon, Ga., succeeding B. Nuttall.

W. A. Rogers, overseer of the carding department at the Enoree Mfg. Company, Enoree, S. C., has resigned.

W. H. Shives has accepted the position as overseer of dyeing at the Royal Bag & Yarn Mfg. Company, Charleston, S. C.

Wm. H. Richardson has severed his connection with the Griswold Worsted Company of Derby, Pa., to accept a position as agent of the Elsworth Mill, of the Southwark Mills Company, Philadelphia.

Joseph H. Stackpole, for 50 years an employe of the Massachusetts Mills Company, Lowell, Mass., was on March 30th honored by the directors. He was given a $1,000 check. He is the oldest employe in continuous service and has a fine war record.

Geo. Wishart, overseer of dyeing at the Assawaga Company, Dayville, Conn., has resigned to accept a position with the Merrimac Hat Company, Amesbury, Mass.

F. Simpson has accepted a position as section hand in the worsted spinning department at the

Geo. H. Gilbert Mfg. Company, Gilbertville, Mass. He comes from Pawtucket, R. I.

David Rennie, overseer of the dressing department at the Brightwood Mfg. Company, No. Andover, Mass., has resigned to accept a similar position at Webster, Mass.

John Hartley has accepted a position as overseer of dyeing at the Hadley Mills, South Hadley Falls, Mass.

Wm. L. McKinstry, time keeper for the Hamilton Woolen Company, Southbridge, Mass., has severed his connection with that company after twenty years of service.

James McMillan, senior member of the firm of McMillan Fur & Wool Company of Minneapolis, Minn., died at his home in that city at the age of 53 years.

Moses S. Buck, overseer of weaving at the Farwell Mills, Lisbon, Me., has resigned, after several years of service. He was presented with a beautiful Masonic ring and easy chair by the employes in the weaving and finishing department.

Earl S. Jenckes, for five years superintendent of the Paul Whitin Mfg. Company, Northbridge, Mass., has severed his connection with that company. The overseers of the Paul Whitin Mfg. Company, through John Bingham, overseer of the weave room, presented Mr. Jenckes with a Knights Templar charm.

George Wishart, overseer of dyeing at the Assawaga Company, Dayville, Conn., has severed his connection with that company. Robert Armstrong, of Woonsocket, but formerly of this place, succeeds him.

M. G. Einstein has accepted the position as designer at the Pontoosuc Woolen Mfg. Company, Pittsfield, Mass. He comes from the Puritan Mills, American Woolen Company, Plymouth, Mass. He was also employed at the Manton Mills, Manton, R. I., Weybosset Mills, Providence, R. I., and at the Saranac Mills, Blackstone, Mass.

Peter C. Costello, Sr., has accepted the position as overseer of finishing at the Vassalboro Mills, North Vassalboro, Me. He comes from Collinsville, Mass.

Walter Pickford, overseer of dyeing at the Litchfield Worsted Mills, Clinton, Mass., has resigned and accepted a position as traveling salesman for the Hussong Dyeing Machine Company, Groveville, N. J.

Alex. Morrison has accepted the position as overseer of weaving at the Capital City Woolen Mills, Des Moines, Ia. He was formerly employed at the Mayflower Worsted Mills, North Adams, Mass.

Geo. A. Roe, for the past twenty years overseer of the mule department at the Hope Webbing Company, Providence, R. I., has severed his connection with that company.

John G. Kearns, overseer of finishing at the Premier Worsted Mills, Wickford, R. I., has severed his connection with that company.

J. E. Barber, agent and superintendent of the Charles River Woolen Company, North Bellingham, Mass., has severed his connection with that company.

Linwood Green has accepted a position as overseer of dyeing at the Forest Mills Company, Bridgeton, Me. He comes from Saugus, Mass.

Claude Braswell, overseer of spinning at the Barbour Cotton Mills, Eufaula, Ala., has resigned and accepted a similar position with the Alabama Cotton Mills, Spigner, Ala.

J. M. Davis has accepted a position as overseer of spinning at the Muscogee Mills, Columbus, Ga.

J. W. Robbins has severed his connection with the Pepperton Mills, Jackson, Ga., as overseer of weaving.

J. A. Street, master mechanic at the Kinston Cotton Mills, Kinston, N. C., has severed his connection with that company.

B. C. Roberts, overseer of carding at the Swift's Cotton Mills, Elberton, Ga., has resigned to accept a similar position with the Harmony Grove Cotton Mills, Commerce, Ga.

Thomas Battye, overseer of finishing at A. Roberts & Company, Claremont, N. H., has resigned to accept a similar position with the Oneko Woolen Mills, New Bedford, Mass.

C. D. Risley has accepted a position as overseer of finishing at the Wuskanut Mill, Farnumsville, Mass. He was formerly employed at Central Village, Conn.

C. E. Cole has accepted a position as overseer of weaving, warping and slashing at the Ella Mfg. Company, Shelby, N. C.

F. H. Birkby, overseer of the dyeing department at the Middlesex Company, Lowell, Mass., has resigned.

Arthur J. Peterson has accepted a position as overseer of dyeing at the Falcon Worsted Company, Pascoag, R. I. He comes from Lebanon, N. H.

Mrs. Ruth B. Spencer, for the past eight years secretary and treasurer of the Crown Worsted Mills, Olneyville, R. I., has resigned. She was presented with a loving cup, suitably inscribed, by the employes at the mill.

Patrick Doyle, overseer of finishing at the Allenton Woolen Mill, Allenton, R. I., has resigned to accept a similar position at the Premier Worsted Mills, Wickford, R. I.

C. G. Gilligan has accepted a position as head bookkeeper and office manager for Cyril Johnson, manufacturer of woolen goods at Stafford Springs, Conn. He was formerly employed for Frederick Faulkner, also a woolen manufacturer of the same town.

Chas. Archer, formerly overseer at the National & Providence Worsted Mills, Providence, R. I.,

has taken charge of sewing and burling at the Livingston Worsted Company, Washington, R. I., who are having their sewing done on Stoke St. in Olneyville on account of the scarcity of sewers in Washington, R. I.

John Riley has accepted a position as overseer of the weaving and finishing departments at the China Mills, Suncook, N. H. He was formerly employed at Providence, R. I.

John Howarth, overseer of the weaving department at the S. Slater & Sons cotton mill at Webster, Mass., has been appointed assistant superintendent.

Geo. W. Engel, superintendent of the M. T. Stevens & Sons Company, Haverhill, Mass., has severed his connection with that company.

Robert F. Whitehouse has been appointed designer at the George's River Mills, Warren, Me. He comes from Tilton, N. H.

Samuel McQuade, designer at the Peace Dale Mfg. Company, Peace Dale, R. I., has resigned to accept a position with Lawrie, Mann & Drowne, commission merchants of New York city.

Robert G. Henderson has been appointed superintendent of the Carolina Mills Company, Carolina, R. I. He was formerly employed at the Pine Tree Worsted Company, Medway, Mass.

Thomas Smith Parker, who for forty years had been a resident of Olneyville, R. I., died at his home, 434 Hartford Avenue, April 11th, at the age of 71 years, of pneumonia. He was employed at the old Union Mills on Hartford Avenue, and when that concern discontinued business, went to the Merino Cotton Mills, where he had charge of a department. About fifteen years ago he retired from the mill business. He is survived by his wife, two sons, a brother and a sister.

James McMillan, one of the most prominent merchants of Minneapolis, Minn., died at his home, 1728 Nicolet Avenue, on March 24th, after a short illness, at the age of 53 years. In 1877 he founded the firm of James McMillan & Company, and in 1898 the firm's business was incorporated as the McMillan Fur & Wool Company. This company built up a large business and in the course of a few years it became widely known throughout the country. He is survived by his mother and three sisters.

H. H. Wood, who for over twenty-nine years had been one of the leading hosiery manufacturers of Lakeport, N. H., died at his home, 50 Washington Street, April 6th, at the age of 67 years, after an illness of several months. His life work had been devoted to the manufacturing of hosiery and by his own efforts he made his way to the front rank of manufacturers. He was a thirty-second degree Mason, a member of the Mount Lebanon Lodge, No. 32, and numerous others. He is survived by his wife and three sisters.

Henry A. Bailey, a well known mill man of Manchester, N. H., and for sixteen years agent of the Chicopee Mfg. Company, Chicopee Falls, Mass., died at his residence, 490 Amherst St., Manchester, N. H., of heart trouble. His death was entirely unexpected, as he was apparently enjoying the best of health. He was 65 years of age. When 16 years of age, he entered the employ of the Amoskeag Mfg. Company, gradually working his way, learning the business in several departments, and was appointed overseer of the dressing department later. When the Jefferson Mill was completed he was appointed superintendent, a position he held for years. He afterwards accepted a position with the Chicopee Mfg. Company.

Samuel Marshall Orr, president and treasurer of the Orr Cotton Mills, Anderson, S. C., and director of the Anderson Cotton Mills, of the same city, died at the John Hopkins Hospital, Baltimore, Md., at the age of 53 years. He is survived by his wife, two daughters and two sons.

Robert Scott, a retired carpet manufacturer, died at his home in Philadelphia at the age of 40 years. He was a past master of the Union Lodge, No. 121, and the F. & A. N., also a member of the Keystone R. A. charter, No. 175. He is survived by a widow and one daughter.

Samuel Whittle, well known throughout the manufacturing district of Kensington, died at his home, 2048 No. 7th St., Philadelphia, at the age of 73 years. He came to Philadelphia from England nineteen years ago and started a small hosiery establishment, afterwards operating plants on Franklin St., Girard Ave. and York St.

David Cushing Philip, formerly superintendent of the Aetna Knitting Mills, of Lansingburgh, N. Y., died at his home on 26 Second Ave., at the age of 76 years. He was appointed superintendent of the Aetna Mills thirty-four years ago and held the position until the death of Wm. A. Harder, the proprietor, eight years ago, when the mill changed ownership. He leaves a wife and two daughters.

Alfred W. Garsed, a prominent resident of Frankfort, Philadelphia, died at his home on Hedge and Unity Sts., at the age of 72 years. Over half a century ago he with his brothers, Richard, Thomas, John, Joshua and Harry, engaged in the textile business with their father, founding the Frogmore Mill at Powder Mill Lane and Frankford Creek and the Wingohocking Mill. The machinery was imported to this country, thus placing them in the front rank of manufacturers of that day.

Frank M. Kelly, selling agent for the Ballard Vale Mills Company, Ballard Vale, Mass., with office in Boston, died suddenly on March 29th of heart disease at his home in Brookline, Mass., at the age of 59 years.

Jos. A. Knight, president of the Graton & Knight Mfg. Company, died at his home, 810 Main St., Worcester, Mass., at the age of 80 years. He was born in Leicester, Mass. After receiving an education he moved to Worcester, where he learned the card clothing and belt making trade.

Jos. W. Preston died at his home on Rutland Rd., Paxton, Mass., at the age of 83 years. Some years ago he was in the manufacture of woolen goods at Providence, R. I. He was a member of the Woonsocket Lodge, A. F. & A. N., and the Woonsocket Lodge, I. O. O. F. He is survived by a wife.

Jos. Bamford, Sr., head of the Bamford Silk Mfg. Company of Paterson, N. J., died at his home in that city at the age of 74 years. He came to Paterson thirty years ago from England and started in the silk business on a small scale, but later becoming one of the largest ribbon manufacturers in the country. He is survived by three sons who will continue the business.

Ezra W. Chapin died at his home in Chapinville, Northboro, Mass. He was a prominent citizen and had a wide acquaintance as a manufacturer of woolen goods. Mr. Chapin was manager of the Northboro Woolen Mills for several years. He had been living with his daughter, Mrs. Townsend, in Worcester and had come to Northboro that day with the intention of looking over his property.

John G. Mills, for a number of years overseer at the Atlantic Mills, Olneyville, R. I., died at his home on Webster Ave. He retired from active mill life a short time ago and had been employed at the American Multiple Fabric Company.

Theodore G. Beckert, designer at the George's River Mill, Warren, Me., has resigned.

Benj. Horsfall, overseer of dyeing at the North Berwick Company, North Berwick, Me., has resigned to accept a similar position with the Middlesex Company, Lowell, Mass.

T. J. Firth has been appointed assistant superintendent under G. J. Carter, who is superintendent of the Bigelow Carpet Company, Clinton, Mass. Mr. Firth has been employed as assistant superintendent of the Hartford Carpet Company, Thompsonville, Conn.

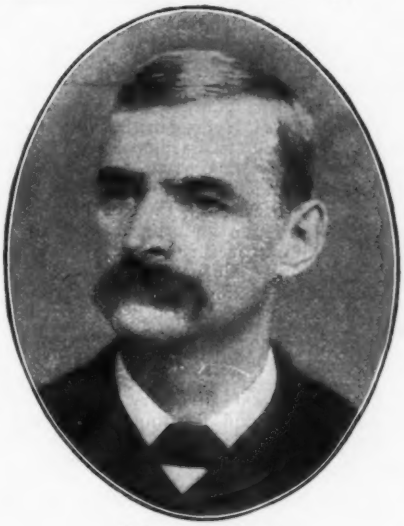
Douglas P. Waters, overseer of carding for Benjamin Lucas & Company, Poquetanuck, Conn., has resigned. This position he has held for the past eight years. His successor is J. P. Matteson, of Shannock, R. I.

DEATHS.

After an illness of four days, George D. Harvey, aged 69, senior member of the firm of Farley, Harvey & Co., wholesale dry goods dealers in Boston, died at his home, 237 Central St., Auburndale. He was a member of St. John's Lodge, A. F. & A. M., St. Andrew's Chapter of Boston, Gethsemane Commandery, K. T., of Newton, the Home Market Club and the Republican Club. He served the National Hamilton Bank of Boston as a director. The funeral will take place Sunday at 3 P. M. from his home. Mr Harvey was widely known as a man of upright character and sterling integrity.
Mass. Mr. Barnes is to become associated with the U. S. Worsted Company.

Wm. M. Johnson, treasurer of the Elliott Mfg. Company, Manchester, N. H., and actively identified with many industries in that city, died at his home, on the corner of Prospect and Oak Sts., in that city after a brief illness. He was born in Manchester, N. H., Feb. 20, 1843, and attended the Franklin Square Church. He was a member of the Derryfield & Intervale Country Club.

William C. Collier, for the past thirteen years a resident of Dracut, Mass., and a highly respected citizen, died at his home, 177 Sladen St. He was born in Scotland, sixty-three years ago, and had been employed as overseer of wet finishing in several mills in Lowell, Mass., and vicinity.



BARCLAY M. DENNY.

The death of Barclay M. Denny, on March 28, has brought upon the Geo. D. Mayo Machine Co., with whom he was connected, and his family and friends, a loss most regrettable. He was born in 1842 at Coatsville, Pa. In 1861 he enlisted in the First Regiment, Pennsylvania Cavalry, and served until March 25, 1863. From that time he held the position as foreman for James L. Branson, manufacturer of knitting machinery, Philadelphia, until 1888, when he entered into a copartnership with Henry Brinton in the manufacture of circular hosiery knitting machinery, and remained a member of the firm of Brinton & Denny until March 15, 1895. Shortly thereafter he was given charge of the Philadelphia office of the Mayo Knitting Machine & Needle Co., which position he held until he resigned in November, 1905, to become the Philadelphia representative of the Geo. D. Mayo Machine Co., with offices in the Knickerbocker Building at Sixth and Arch Sts., which connection he retained to the time of his decease. He was an inventor of much ability, bringing out a number of knitting machines and improvements. To a most engaging and attractive personality as a Christian gentleman, he added an exceedingly modest demeanor, which led him to avoid all self-seeking, and he endeared himself to all whom he came in contact with. He was widely known and respected by the entire hosiery trade.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Modern Bleaching and Stripping Processes (Bleich-und Detachiermittel der Neuzeit); by Prof. Max Bottler; 154 pages; 5 1/2 by 9; A. Ziemsen Verlag, Wittenberg, Germany. Price, $2.50.

This work, which is freely illustrated, is divided into two parts, the first treating of the mechanical and chemical processes of bleaching; the second, of the processes of stripping and scouring. Following is an abstract of the table of contents:

First Part. 1. Peroxide of Soda; 2. Perborate; 3. Ozone; 4. Bisulphite of Soda; 5. Stripping Colors with Hydrosulphurous Acid; 6. Permanganate; 7. Peroxide of Hydrogen; 8. New Bleaching Processes for Oils, Fats, Paraffine, Soap and Glue; 9. Hypochlorite of Calcium; 10. Electric Bleach.

Second Part. 1. Benzine Soaps; 2. Extracting and Stripping Processes; 3. Carbon Tetrachloride; 4 Acetic Acid as a Stripping Agent; 5. Stripping by the Bleaching Process; 6. Peroxide of Hydrogen as a Stripping Agent; 7. Oxygenol as a Stripping Agent; 8. Peroxide of Soda as a Stripping Agent; 9. Various Recent Processes for Stripping and Scouring.

The text of this useful book is in German.

American Report and Directory of the Clothing Manufacturers and Cutting Up Trade for United States and Canada; Dockham Publishing Co., 6 Beacon St., Boston, Mass. Price $15.00.

The sixth edition of this work has been received and shows careful preparation. A directory of manufacturers in the United States and Canada is given under various classifications such as manufacturers of clothing, awnings, sails, tents, etc., boots and shoes, rubber goods, trunk, bag, and many others. It also contains a list of jobbers, commission houses, and department stores. A very complete book has been produced.

American Report and Directory of the Jobbing trade and Department Stores for the United States and Canada; Dockham Publishing Co., 6 Beacon St., Boston, Mass. Price $1.00.

The 1909 edition of this book has been issued in convenient and attractive form. All jobbers and department stores are listed under each state, and a simple system of marks is used to distinguish between jobbers and department stores and lines of goods handled. Thiis is, undoubtedly, much better than having the book divided into sections where one is compelled to look under several headings for names wanted.

Cotton Facts; by Albert Shepperson, New York City. Price $1.00.

We have received a copy of the 1908 edition of this useful handbook of the cotton trade. The statistical tables have been brought up to date and in addition there are articles on "New York as a Cotton Market" and "Cotton Futures in New York, Liverpool and New Orleans."

Decoration des Tissues; by Paul Lamoitier; 155 pages, 10 by 13; Ch. Beranger, Paris, France. Price $5.00.

This is a series of articles treating of the decoration of fabrics by weaving, printing and embroidery. The detailed explanation is accompanied by numerous illustrations, the whole being systematically arranged in such shape as to facilitate reference to any particular division of the subject. The text is in French.

Modern Bleaching and Stripping Processes; by Prof. Max Bottler; 154 pages, 5 1/2 by 8 1/2; Verlag von A. Ziemsen, Wittenberg, Germany. Price $2.00.

This work begins with a brief review of old and modern methods of bleaching, this being followed by treatment of the subject in the following subdivisions: 1. Peroxide of sodium; 2. Borates; 3. Ozone; 4. Bisulphite of soda; 5. Stripping textile materials with hydrosulphurus acid; 6. Permanganate; 7. Peroxide of hydrogen; 8. New bleaching methods and materials for fats, waxes, paraffine, soap and glue; 9. Hypoclorite of lime; 10. Electric bleaching.

The second part of the work is devoted to various stripping agents. The text is in German.

A Technical Cyclopedia (Lexikon der Gesamten Technik); by Otto Lueger; Deutsche Verlags-Austalt, Stuttgart and Leipsiz, Germany; complete in 40 parts. Price $100.

We have received Nos. 31, 32 and 33 of this elaborate work which is being issued in sections from the German press. The same high standard of reading matter and illustrations is maintained in the latest installment as have prevailed throughout the preceding numbers. The text is in German.

The Commercial Handbook of Canada; Heaton's Agency, Toronto, Canada; 381 pages, 4 1/2 by 7. Price $1.00.

This book contains a lot of miscellaneous information relating to Canada, selected for its value to merchants, manufacturers and business men in general. There is a directory of the various government departments, both executive and legislative, postal information, time cards showing the departure of mails, railway fares throughout Canada, a list of banks and guaranteed solicitors in Canada and the United States, railways, steamship lines, and a copy of the Canadian tariff and custom regulations. The second part of the book is entitled the Canadian Encyclopedia. It gives a digest of the government reports and classified information regarding Canadian mining companies.

Regulation of Steam Apparatus (Reglementation des Appareils a Vapeur); Societe d'Editions Techniques, 16 rue du Pont-Neuf, Paris; price 50 cents.

A pamphlet giving a resume of the new French law regulating the use of steam apparatus of various kinds. The text is in French.

Olive Oleine.

Seventy per cent. Olive Oleine has been used by worsted mills in Yorkshire, England, for many years, particularly in mills spinning 60s and under. There are some American worsted mills who have thought nothing but olive oil can be used with good results, but the present high price of this product has caused worsted manufacturers to take notice and a number of them have been much pleased with the results obtained from Olive Oleine. Being a distilled oil on a fixed formula it is always uniform and another advantage is that it will not gum up when the temperature falls or when the machinery is shut down for any length of time. The agents, H. G. McKerrow Co., Ltd., Boston, guarantee a considerable saving in noils over the use of lard or similar oils.

Sizing Warps.

Sizing warps in the chain system may prove very costly, if the right kind of size is not used; any practical worker knows what trouble there may be, especially when the threads stick together. The Arabol Manufacturing Company, 100 William St., New York, meet sizing difficulties by three modern, scientific, specializing methods. Three Soluble Softening Oils, and Sizeoleum are used with success by Southern and Northern mill superintendents on goods mixed either with corn or potato starch. On print cloth warps, sheetings and domestics, the Sizeoleum has been found to be most reliable and superior compound, but no tallow must be used with it.

New Salesrooms.

The Oswego Machine Works, builders of all kinds of cutting machinery, have opened a new salesroom at 203 Wooster St., with an office at 150 Nassau St., New York City, with W. S. Timmis as manager of the New York branch. A new store and office has also been opened at 347 Dearborn St., Chicago, under the management of J. M. Ives. In both these branches their improved cutting machines are shown running with all the latest improvements.

Large Conflagrationin Rochester.

On April 13th, about 5.05 P. M., the Eureka Fire Hose Mfg. Co., 13 Barclay St., New York, received a telephone message, requesting them to ship 5,000 feet of Paragon fire hose, complete with couplings, at $1.00 per foot, by express. Notwithstanding the fact that the works closed down at 6 P. M., by running departments overtime, they shipped the entire 5,000 feet on the fast New York Central Express leaving New York at 11.45 P. M. It was necessary to thread 100 sets of couplings, attach them to the hose, and then haul the hose from the works in Jersey City to 47th St. and Madison Ave., New York, to the American Express Company's receiving station.

A universal thread for all fire departments would be a great advantage, as it would enable such a company as the Eureka to carry several thousand sets on hand, and they would be able to ship a very large quantity of hose in case of an emergency in a few hours after receipt of order.

In New Offices.

The American Finishing Machinery Co. have removed their offices from 45 Milk St. to 141 Milk St., in the Oliver Building, corner of Milk and Oliver Sts., where they have more than twice their former office room.

They have in their offices a full sized bristle cloth stretcher applied to dry can which shows the recent improvements in the method of adjustment and the ease with which the pressure can be regulated and changed as desired. The new brush units with metal holder are a vast improvement over the original type and several other features have recently been added.

The Silk Association of America.

At a meeting of the board of managers of this association held on April 15th, Mr. Jacques Huber was elected secretary in place of Franklin Allen, deceased, and Mr. Ramsay Peugnet was elected assistant secretary. Mr. Huber has for many years been a successful silk manufacturer and will bring to his new position all the qualities necessary for a successful administration. Mr. Peugnet is the secretary and treasurer of the New York Silk Conditioning Works and of the Security Silk Storage Co., New York.

Pure Water.

Hungerford & Terry, filtration engineers, Penna. Building, Philadelphia, Pa., report that they have recently installed filtration plants in the following textile mills: United Piece Dye Works, Lodi, N. J., 1,000,000 gallons per day; National Silk Dye Works, Paterson, N. J., 1,500,000 gallons per day; The Hamilton Rubber Manufacturing Co., Trenton, N. J., 90,000 gallons per day; The Revolution Cotton Mills, Greensboro, N. C., 1,300,000 gallons per day; Great Falls Bleachery, and Dye Works, Somersworth, N. H., 300,000 gallons per day, and the Weidmann Silk Dyeing Co., Paterson, N. J., 600,000 per day. There are only a few of the filtration plants that have been installed by this concern in textile mills which have had trouble with their water and which has been overcome after consultation with them and in many instances repeat orders have been placed, until at this time their filtration plants can be seen in successful operation in almost all parts of the country.

Cloth Cutters.

Electric cloth cutters, manufactured by the Eastman Machine Co., 41-43 E. Eagle St., Buffalo, N. Y., are being recognized generally as most efficient machines. This company is well equipped in their new factory and the business is constantly on the increase. Among recent shipments is one to the Tillotson Mfg. Co., Pittsfield, Mass., and another to the Tremont and Suffolk Mills of Lowell, Mass.

Business Literature.

Humidity and Humidifiers for Textile Mills; the Bell Pure Air & Cooling Co., New York.

A catalogue of 19 pages, which begins with a general account of the principles governing humidification. This is followed by a table giving the results of tests to determine the effect of moisture on yarn. The report of these tests was originally published in Oesterreichs Wollen & Leinen Industrie and the English translation published in the Textile World Record of January, 1909. Next comes an account of humidification in textile mills, the catalogue concluding with a description of the Bell humidifier.

Sirocco; The American Blower Co., Detroit, Mich.

This is an attractive catalogue dealing with the Sirocco blowers and fans. Among the features is a comparison of the Sirocco wheel with former types of steel plate fans. There are also illustrated typical installations for ventilating buildings and mines and for mechanical draft and marine applications. The catalogue also gives capacity tables for the Sirocco fans and a partial list of American users to whom reference is made.

The Johnson Friction clutch; The Carlyle Johnson Machine Co.. Hartford, Conn.

This pamphlet is larger than previous ones and contains much additional information in regard to driving machinery direct from line shafting, through friction clutches, thus eliminating countershafting, cross belting, etc. It contains many fine illustrations and valuable information.

Textile Motor Talks; Westinghouse Electric & Mfg. Co., Pittsburg, Pa.

This is the sixth of a series that have been issued by this company. It is a four-page leaflet describing the driving of the fly frame.

Blowers and Exhausters for Forges and Furnaces; The American Blower Co., Detroit, Mich.

This 24-page booklet contains detailed information regarding the American Blower Co.'s line of blowers and exhausters. It contains numerous illustrations of the different types of apparatus. also many valuable tables relating to the mechanical movement of air by blowers and exhausters.

Protection Against Fire; The Eureka Fire Hose Mfg. Co., 13 Barclay St., New York.

This is a well bound catalogue of 224 pages, in which are illustrated and described fire hose, couplings, nozzles, valves, pipe connections, ladders, and in fact all the accessories of a well equipped fire department, including fire engines and hose carts. The catalogue is filled with excellent illustrations of the apparatus, the work being carefully indexed so as to permit of quick reference to any article desired. A copy will be mailed to interested parties on application.

Universal Winding System.

A handsome illustrated booklet issued by the Universal Winding Co.. 95 South St., Boston, tells the history of the invention and development of the Universal winding system, and illustrates the various types of machine now built to meet various requirements, as well as the packages wound on these machines. It is illustrated by 32 fine cuts.

Bailey's Cold Air Drier.

When the cold air drying system for worsted yarn was introduced some years ago by Frank Bailey of Cedarbrook, N. J., there were some who expressed doubt as to how it would work, but there are now many worsted mills in every section using it successfully, who have placed repeat orders as they need additional capacity, which is the best evidence of satisfaction.

The advantages claimed for this system of drying are that it leaves the yarn in fine condition, with the right "feel," the colors are bright, and there is oftentimes a gain in yardage and as very little heat is required there is saving in expense and the use of steam.

Correction.

In the article "Fine English Worsteds" on page 671 of the March issue, an error occurred. The sentence should read: "If you went to really tip-top people you would have to pay 6d to 9d (12c. to 18c.) a yard more."

Installing Hygrosso System.

The Leader Weaving Co. of Central Falls, R. I., will use the Hygrosso humidifiers to equip their new cotton mill which they expect to occupy shortly. They are also using the Hygrosso system in their present plant.

A New Combing Plant.

The Norton Mills Co., Norton, Mass., are commencing as a branch of their present business of wool scouring and carbonizing, a commission wool combing plant. Joseph A. Middlebrook, formerly manager of The Barre Wool Combing Co., and lately of the Hudson Worsted Co. ,will have entire charge of this branch. To begin with there will be 16 combs of the latest and most modern type, which amount will be increased in the near future. It is the intention of this firm to comb on commission all grades of wool and to put down sufficient machinery to meet the demands of the trade and to prevent the serious delays in the delivery of tops which spinners have had to contend with lately. They will commence operations early in June and have already booked orders for that time.

Perfect Marking Ticket.

Many manufacturers have come to the conclusion that the appearance of the ticket attached to the goods is an important point. A handsome ticket shows that the manufacturer has respect for his own goods

A perfect marking ticket must make a good appearance, be strong so not to get torn or wholly removed in handling and should not have exposed staple ends to damage the goods or scratch the fingers.

The operator should be able to put it on easily and quickly. It should stay until intentionally

removed, and be easily removed without tearing, cutting, or soiling the article marked. Such a ticket attractively gotten up is not only a great convenience but adds much to the appearance of the goods as well.

The materials used in the make up of such a ticket must be of good quality to carry a good appearance and meet requirements as to durability.

The A. Kimball Co., 307-309 Broadway, New York, have long studied the textile manufacturer's ticket needs and manufacture a marking ticket which is as near perfect as skill and care can make it. They put out a large line of tickets and labels comprehensive enough to meet almost any need, and if told the requirements will submit samples and suggestions.

National Association of Woolen and Worsted Overseers.

The following notice regarding the semi-annual meeting is sent out from the office of the Secretary:

The twenty-sixth semi-annual meeting of the N. A. of W. & W. O. will be held at Boyden Heights, Providence, R. I., on Saturday, May 15, at 10 A. M., sharp. There will be the usual business to be transacted, and the following amendment will be acted upon:

Amendment Art. III, Sec. 1, to read: Any superintendent, overseer or designer in good standing, over any department in a woolen or worsted mill, may become a member of this Association by a majority vote of the members present at any regular meeting.—(Signed) C. M. Hurst, E. Fred Deverall, James E. O'Kell.

Nominations of officers for the coming year will be made at this meeting.

F. P. Gallagher, President.
Walter Pickford, Secretary.

Mica Flake Lubricant.

This product is just what its name implies. It is mica, it is a flake and it is a lubricant to be used in connection with lubricating oils or grease. The flake formation of mica is the vital point and marks the difference between Mica Flake Lubricant and graphite and other lubricating materials. Even when ground to a fine impalpable powder, each individual particle is still a flake—a thin, flat piece of mica, presenting two perfectly smooth parallel surfaces, with feathery edges.

Mica Flake practically re-surfaces the journals and bearings, giving a degree of smoothness unattainable by the highest polish.

By thus presenting uniformly true and smooth bearing surfaces, it may be seen that Mica Flake gives the lubricating oil full play, and actually keeps the bearing surfaces apart. As the bearing surfaces do not actually touch each other, friction is reduced to a minimum, and of necessity, the life of the oil is greatly lengthened. Experience shows that Mica Flake practically doubles the life of lubricating oils.

Mica Flake is used in the same manner as graphite. Mica Flake does not cake or harden, and cannot be squeezed out of the bearings. Mica Flake is cleanly—it is nothing but pure white Mica—it will not of itself damage or soil the finest fabric or material, and even mixed with oil it is claimed it will not blacken or discolor. Mica Flake is very light and economical, weighing only about one-quarter as much as graphite. A teaspoonful of Mica Flake to a pint of oil is about the usual "dose."

Different grades of Mica Flake Lubricant are made for different purposes. The manufacturers are the United States Mica Co., 238 La Salle St., Chicago. They invite mill men to send for a free sample, stating for what purpose it is to be used and they would be glad to send enough to mix with a pint of oil for ordinary lubricating purposes and of the right grade for special use.

Ice Making Machines.

The season of the year is approaching when the installation of ice making and refrigerating plants will provide a means of adding greatly to the comfort of the operatives in the mills. An ever increasing number of large plants are installing these outfits which are not so expensive as many imagine.

The Remington Machine Co. of Wilmington, Del., one of the largest manufacturers in the country of this line of machinery, have installed plants in a number of textile mills, some of which are for the sole purpose of contributing to the welfare of the operatives and others are installed not only for that purpose but are used in connection with mechanical purposes, particularly in certain kinds of dyeing.

Napier & Herrick, 346 Broadway, N. Y., have been appointed sole selling agents for the output of the National Underwear Co. of Spring City, Pa., manufacturers of ladies' ribbed underwear.

Booking Large Orders.

Mr. Jacob Bauers, the general manager of the Standard Machine Co., builders of knitting machines at 12th and Callowhill Sts., Philadelphia, reports that business with them is in a very prosperous condition. During the past two months they have booked many orders, the amount of business placed with them being larger than at any time since this concern has been selling their machines to the knitting trade. He also states that the prospects for future business is brighter now than ever before.

Massachusetts, Fall River. The Fall River Iron Works Co. are equipping two additional departments in their plant with the Hygrosso system of air humidifying. This will make four complete departments in this large plant equipped with the Hygrosso system, the last being the third order received within the past few months.

Matthew Tait has accepted a position as overseer of weaving at the Strathmore Worsted Mills, Concord Junction, Mass. He was formerly employed at the Beoli Mills, Fitchburg, Mass.

L. H. Talcott, who has been employed in the designing department of the Globe Woolen Company, Utica, N. Y., has been promoted to the position of assistant designer. He fills the position formerly held by Wm. Easton.

(Continued from front part of magazine)

The Annual Meeting of the National Association of Cotton Manufacturers.

Semi-Combing.

ELWIN HOLBROOK ROONEY, Whitinsville, Mass.

In the beginning the object of combing was to remove the short fibers from staple cotton, thus enabling the spinner to draw equal lengths of fiber into a fine, round even and strong thread. In the longest staples of cotton, there is a variation in the lengths of the fiber of from 15 to 25 per cent., depending upon the quality and grade; and by doing away with this variation it was always an easy matter (if the cotton was properly drawn and correctly drafted) to get an even yarn. In the last fifteen to twenty years, however, competition has compelled the spinner to use shorter staple cotton and still demands equally as good yarns as were produced in previous years by the use of the longer stapled cotton. The problem of the machine builder has been to perfect the comber to enable the spinner to accomplish the results demanded by the trade. Additional classes of yarn have come to require combed cotton; one of which, hosiery yarn, is spun from cotton ranging in staple from seven-eighths of an inch to one and one-eighth inches and, of late years, has to be combed almost exclusively for two reasons: (1) it must be well cleaned and (2) it must be round, even and a lofty thread.

We therefore, gentlemen, present to you the question of semi-combing or, in other words, a method of obtaining a high production; namely, one thousand pounds per week of semi-combed work, with the percentage of noils approximately eight per cent. It is our claim that in the process of semi-combing, which includes carding and combing, the loss in waste is not greater than in the method of double carding. By the former process, the spinner is enabled to increase the production of his card from 25 to 50 per cent. above what he could produce in double carding and the result is that, by the process of combing instead of carding, he removes the shorter fibers from his cotton (which he could not do by the use of the second process of carding) arriving at a finer, rounder, stronger thread, which can be spun with less twist, giving him a greater production with the same break; or if spun with the same twist, we claim he will get an increased breaking strength of from 10 to 15 per cent. on No. 36s yarn. The tables which follow will, we believe, prove this to you.

First we took 1,948 pounds of 1 3/16 inches American cotton, double carded it on old American cards, to spin No. 36s warp and No. 48s filling.

BREAKER CARDING.

	lbs.	lbs.
Total amount of cotton in picker laps,		1,948
Carded double laps	1,737	
Carded clean waste	118	1,855
Cylinder and top strips	54	
Fly and droppings	22	
Sweeps	8	
Invisible loss	9	93
		1,948

Loss in waste, 4.8 per cent.

Weight of lap	oz. 12
Weight of sliver	gr. 75
Production	lbs. per hr. 5½
Draft	66.64

(Doubling done on regular Derby Doubler 34 inches wide. No draft. Doubling 55 ends. Lap 7 1/2 oz. per yard. Production 300 pounds per hour.)

FINISHER CARDS.

	lbs.	lbs.
Total amount of cotton in double laps,		1,737
Carded clean sliver	1,561	
Carded clean waste	37	1,598
Cylinder and top strips	41	
Fly and droppings	80	
Sweeps	6	
Invisible loss	12	
		139
		1,737

Loss in waste, 8 per cent.

Weight of lap	oz. 7½
Weight of sliver	gr. 60
Production	lbs. per hr. 4
Draft of card	50.31

Railway Head, doubling seven, finishing 62 gr. sliver; draft 6.77.

Breaker Drawing Frame, doubling six, finishing 66 gr. sliver; draft 5.63.

Finished Drawing Frame, doubling six, finishing 72 gr. sliver; draft 5.50.

Slubber, making 50/100 hank roving; draft 4.35.

First Intermediate, making 90/100 hank roving; draft 3.60.

Second Intermediate, making 2.10 hank roving; draft 4.66.

Roving Frames, making 7.79 hank roving; draft 7.42.

Spinning No. 36s; draft 9.24; twist 27.93 turns per inch.

Roving Frames, making 8.33 hank roving; draft 7.93.

Spinning on Mule, No. 48s; draft 10.52; twist 21 turns per inch.

SPINNING FRAMES.

Date	Size	Break
Jan. 19	36.48	58.25
Jan. 20	36.94	53.75
Jan. 21	36.03	54.75
Jan. 22	35.96	55.37
Jan. 25	36.04	56.00
Jan. 26	36.15	58.00
Jan. 27	35.34	58.50
Jan. 28	36.65	54.12
Averages	36.20	56.09

NUMBER OF ENDS DOWN PER DAY.

Nos. of frames	93	95	77	79	133	156
Jan. 19	171	139	102	142	55	75
Jan. 20	78	112	74	76	80	52
Jan. 21	146	61	106	90	177	89
Jan. 22	118	102	146	64	121	79
Jan. 25	86	74	121	91	137	51
Jan. 26	61	79	155	108	101	44
Jan. 27	72	64	107	61	149	48
Jan. 28	46	47	44	23	84	26
Averages	97	84	107	82	119	58

General average: 91 per frame on 248 spindles per day.

Spooling: Could not see any difference in this process.

Warping: 9 beams, 400 threads each; 1 beam, 418 threads each (10 beams contain 4,018 ends).

Could not see any difference in this process.

Slashing: Selvage contains 20 No. 38 3-ply threads per side; total number of threads per warp for loom 4,058. Could not see any difference in this process.

Mule Spinning: Size, 50.73; break, 24.50. Could not see any difference in this process.

Weaving: Sley, 96; picks, 132; width, 43 inches; weight, 3.35 yards per pound.

On Six Looms.

Date.	Filling break.	Warp break.	Cops that did not run out.	Cops that did run out.
Feb. 11	53	69		
Feb. 12	35	77	37	203
Feb. 13	22	30	23	110
Feb. 15	44	77	28	269
Feb. 16	62	44	37	246
Feb. 17	72	45	50	274
Feb. 18	50	34	33	333
Feb. 19	54	55	27	327
Feb. 20	7	16	5	127
Total,	399	447	240	1,889

Average: 44 50 per day.

Cop waste made in weaving sample, 3 pounds.

Cloth Room Report: This was regular work.

The second test consisted of a lot of 2.389 pounds of 1 3/16 inch American cotton, which we single carded on Revolving Flat Cards, spinning No. 36s warp and No. 48 filling.

CARDING.

	lbs.	lbs.
Total amount of cotton in picker laps,		2,389
Carded clean sliver	2,221	
Carded clean waste	20	2,241
Cylinder and flat strips	102	
Fly and droppings	46	148
		2,389

Loss in waste, 6.2 per cent.

Weight of lap	oz. 12
Weight of sliver	gr. 45
Production	lbs. per hr. 9½
Draft of card	117.75

Railway Head, doubling eight, finishing 62 gr. sliver; draft 5.80.

Breaker Drawing Frame, doubling six, finishing 66 gr. sliver; draft 5.63.

Finishing Drawing Frame, doubling six, finishing 72 gr. sliver; draft 5.50.

Slubber, making 50/100 hank roving; draft 4.35.

First Intermediate, making 90/100 hank roving; draft 3.60.

Second Intermediate, making 2.10 hank roving; draft 4.66.

Roving Frames, making 7.79 hank roving; draft 7.42.

Spinning No. 36s; draft 9.24, twist 27.93 turns per inch.

Roving Frames, making 8.33 hank roving; draft 7.93.

Spinning on Mule, No. 48s; draft 10.52, twist 21 turns per inch.

SPINNING FRAMES.

Date	Size	Break
Jan. 26	36.94	55.50
Jan. 27	36.20	55.60
Jan. 28	36.63	52.75
Jan. 29	36.41	54.00
Feb. 1	36.90	54.75
Feb. 2	37.50	50.84
Feb. 3	37.63	52.25
Feb. 4	37.62	53.00
Averages	36.98	53.46

NUMBER OF ENDS DOWN PER DAY.

Nos. of frames	122	102	90	119	118	121
Jan. 26	..	70	80	..	..	..
Jan. 27	97	83	96	87	..	..
Jan. 28	99	91	87	133	..	..
Jan. 29	83	81	62	97	154	132
Feb. 1	55	49	48	58	67	60
Feb. 2	72	98	103	134	115	110
Feb. 3	96	98	141	166	170	61
Feb. 4	146	110	99	141	121	89
Averages	92	85	89	116	125	90

General average: 99 per frame on 248 spindles per day.

Spooling: Could not see any difference in this process.

Warping: 9 beams, 400 threads each; 1 beam, 418 threads each (10 beams containing 4,018 ends).

Could not see any difference in this process.

Slashing: Selvage contains 20 No. 36 3 ply threads per side. Total number of threads per warp for loom, 4.058. Could not see any difference in this process.

Mule spinning: Size, 50.61; break, 18.75. Could not see any difference in this process.

Weaving: Sley, 96; picks, 132; width, 43 inches; weight, 3.35 yards per pound.

On Six Looms.

	Filling break.	Warp break.	Cops that did not run out.	Cops that did run out.
Feb. 22	67	71	25	272
Feb. 23	71	52	31	313
Feb. 24	49	61	34	329

Feb. 25 50	73	43	289
Feb. 27 70	29	49	..
Mar. 1 121	73	87	..
Total 428	359	269	1,202

Averages: 71 60 per day.

Cop waste made in weaving sample, 2 1/2 pounds.

Cloth Room Report: Cloth was about the same for cleanliness as regular work produced by the system of double carding on old American Top Flat Cards.

The third test was made with a lot of 2,331 pounds of 1 3/16 inch American cotton, which we double carded on Revolving Flat Cards, spinning as heretofore No. 36s warp and No. 48s filling yarns.

BREAKER CARDS.

	lbs.	lbs.
Total amount of cotton in picker laps,		2,331
Carded sliver	2,182	
Carded clean waste	20	2,202
Cylinder and top strips	87	
Fly and droppings	41	
Invisible loss	1	129
		2,331

Loss in waste, 5.5 per cent.

Weight of lap ....oz. 16
Weight of sliver ....gr. 64
Production ....lbs. per hr. 11
Draft of card 111.50

(Doubling was done on sliver lap machine 9 3/4 inches wide, doubling 26 ends, making lap 1,375 gr. per yard, draft 1.22, production 400 pounds per hour. Four laps made 39 inch lap for double carding, 12 1/2 ounces per yard, with doubling of 104 ends.)

Clean lap waste ....lbs. 25

FINISHER CARDS.

	lbs.	lbs.
Total amount of cotton on spools.....		2,157
Carded sliver	2,030	
Carded clean waste	20	2,050
Cylinder and top strips	85	
Fly and droppings	19	
Invisible loss	3	107
		2,157

Loss in waste, 4.8 per cent.

Weight of lap ....oz. 12½
Weight of sliver ....gr. 45
Production ....lbs. per hr. 9½
Draft of card 117.75

Railway Head, doubling eight, finishing 62 gr. sliver, draft 5.80.

Breaker Drawing Frame, doubling six, finishing 66 gr. sliver, draft 5.63.

Finisher Drawing Frame, doubling six, finishing 72 gr. sliver, draft 5.50.

Slubber, making 50/100 hank roving, draft 4.35.

First Intermediate, making 90/100 hank roving, draft 3.60.

Second Intermediate, making 2.10 hank roving, draft 4.66.

Roving Frames, making 7.79 hank roving, draft 7.42.

Spinning No. 36s, draft 9.24, twist 27.93 turns per inch.

Roving Frames, making 8.33 hank roving, draft 7.93.

Spinning on Mule, No. 48s, draft 10.52, twist 21 turns per inch.

SPINNING FRAMES.

Date.	Size.	Break.
Jan. 20	35.53	60.25
Jan. 21	35.75	57.75
Jan. 22	38.21	51.25
Jan. 23	37.14	52.50
Jan. 25	37.50	54.25
Jan. 26	37.39	54.25
Jan. 27	38.67	49.75
Jan. 28	35.60	55.50
Averages	36.97	54.42

NUMBER OF ENDS DOWN PER DAY.

Nos. of frames 119	118	121	122	102	90
Jan. 20 217	154	88	112	160	90
Jan. 21 316	272	98	136	288	275
Jan. 22 229	189	269	265	215	179
Jan. 23 111	101	91	80	101	70
Jan. 25 268	219	124	203	139	147
Jan. 26 176	173	181	201	142	130
Jan. 27 171	160	90	120	90	112
Jan. 28 158	136	120	95	110	110
Averages 206	175	132	151	155	139

General average: 159 per frame on 248 spindles per day.

Spooling: Could not see any difference in this process.

Warping: 9 beams, 400 threads each; 1 beam, 418 threads each (10 beams containing 4.018 ends). Could not see any difference in this process.

Slashing: Selvage contains 20 No. 36 3 ply threads per side. Total number of threads per warp for loom 4.058. Could not see any difference in this process.

Mule Spinning: Size, 50.06; break, 18.50. Could not see any difference in this process.

Weaving: Sley 96; picks 132; width 43 inches; weight 3.35 yards per pound.

On Six Looms.

	Filling break.	Warp break.	Cops that did not run out.	Cops that did run out.
Feb. 11 77	30	..	..
Feb. 12 71	41	95	205
Feb. 13 31	12	46	99
Feb. 15 106	36	55	272
Feb. 16 156	29	89	240
Feb. 17 157	42	58	265
Feb. 18 110	29	77	295
Feb. 19 91	31	46	301
Feb. 20 28	17	12	131
Total, 827	267	478	1,808

Averages: 92 30 per day.

Cop waste made in weaving sample, 5 1/2 pounds.

Cloth Room Report: Cloth much cleaner than regular work produced when double carding on the old American Card or single carding on the Revolving Flat Card.

The fourth and final test was made with a lot of 1,206 pounds of 1 3/16 inch American cotton which was carded on revolving flat cards, combed on the Whitin High Speed Comber, and spun into No. 36s warp and No. 48s filling yarns. The increase in production over the average carding on the revolving flat card in the double carding system was approximately 28 per cent.

CARDS.

	lbs.	lbs.
Total amount of cotton in picker laps,		1,206
Carded sliver	1,155	
Carded clean waste	6	1,161
Cylinder and top strips	22	
Fly and droppings	21	
Invisible loss	2	45
		1,206

Loss in waste, 3.7 per cent.

Weight of lap	oz. 12
Weight of sliver	gr. 50
Production	lbs. per hr. 14
Draft of cards	101
Presented to the Sliver Lap Machine,—	
Carded sliver	lbs. 1,155

SLIVER LAP MACHINE.

Lap 9 3/4 inches wide, doubling 20 ends, making a lap 500 gr. per yard, draft 2, production 125 pounds per hour.

RIBBON LAP MACHINE.

Lap 11 3/4 inches wide, doubling 4 laps, making lap 500 gr. per yard, draft 4, production 125 pounds per hour.

Clean lap waste ..... lbs. 16

COMBERS.

	lbs.	lbs.
Total amount of cotton on spools		1,139
Combed sliver	1,036	
Comber noils	103	1,139

Loss in waste, 9 per cent.

Weight of comber lap	gr. 500
Weight of comber sliver	gr. 55
Production	lbs. per hr. 18
Draft of comber	66

(You will note that in semi-combing the process of the Railway Head is dispensed with, two processes of drawing being sufficient, because one process of drawing is taking place at the draw box of the comber.)

Breaker Drawing Frame, doubling six, finishing 64 gr. sliver, draft 5.15.

Finisher Drawing Frame, doubling six, finishing 72 gr. sliver, draft 5.33.

Slubber, making 50/100 hank roving, draft 4.35.

First Intermediate, making 90/100 hank roving, draft 3.60.

Second Intermediate, making 2.10 hank roving, draft 4.66.

Roving frames, making 7.79 hank roving, draft 7.42.

Spinning No. 36s, draft 9.24, twist 27.93 turns per inch.

Roving Frames, making 8.33 hank roving, draft 7.93.

Spinning on Mule, No. 48s, draft 10.52, twist 21 turns per inch.

SPINNING FRAMES.

Date.	Size.	Break
Mar. 25	35.49	62.50
Mar. 26	35.48	63.50
Mar. 29	35.01	62.25
Mar. 30	35.49	62.75
Mar. 31	37.25	58.00
Averages	35.54	61.80

NUMBER OF ENDS DOWN PER DAY.

Nos. of frames	79	77	95	121	122	133
Mar. 25	31	20	28	28	22	40
Mar. 26	32	39	30	32	20	52
Mar. 27	19	44	26	33	25	74
Mar. 29	46	76	62	41	37	66
Mar. 30	42	91	86	50	31	67
Averages	34	54	46	35	27	59

General average: 42 per frame on 248 spindles per day.

Spooling: Could not see any difference in this process.

Warping: 9 beams, 400 threads each; 1 beam, 418 threads each (10 beams containing 4,018 ends). Could not see any difference in this process.

Slashing: Selvage contains 20 No. 36 3-ply threads per side. Total number of threads per warp for loom 4,058. Could not see any difference in this process.

Mule spinning: Size, 52.72; break, 28.25. Could not see any difference in this process.

Weaving: Sley, 96; picks, 132; width, 43 inches; weight, 3.35 yards per pound.

On Six Looms.

	Filling Break.	Warp Break.	Cops that did not run out.	Cops that did run out.
April 12 ...	25	31	24	295
April 13 ...	21	25	10	337
April 14 ...	15	32	5	321
April 15 ...	21	37	8	337
April 16 ...	12	19	6	300
Total,	94	144	53	1,590

Averages: 19 29 per day.

Cop waste made in weaving sample one-fourth of a pound.

Cloth room report: The cloth was far superior to that produced by the double carding system; in fact, had the appearance of combed work.

Following is a summary of the above tests.

	Double Carding on old American Top Flat Cards.	Single Carding on Revolving Flat Cards.	Double Carding on Revolving Flat Cards.	Semi-Combing.
Loss in waste,	12.8	6.2	10.3	12.7
Size	36.20	36.98	36.97	35.54
Break	56.09	53.46	54.42	61.80
Average break per day per frame (spinning)	91.	99.	159.	42.
Average break per day per loom,				
Warp	50.	60.	30.	29.
Filling	44.	71.	92.	19.
Pounds of waste in weaving,	3.	2.50	5.50	.25

To sum up, we derive a benefit in breaking strength in spinning, by semi-combing, of 13 per cent., which reduced the breakage of ends in spinning 74 per cent. For the purpose of comparison of breakage in warp and filling in weaving, we have taken five consecutive full working days in each process, which shows for the semi-combing 12 per cent, less breakage of ends in the warp, and in the filling a reduction in breakage of 85 per cent., while the cop waste was reduced 96 per cent.

Double Carding on old American Cards.	Single Carding on Revolving Flat Cards.	Double Carding on Revolving Flat Cards.	Semi-Combed Work.
Regular Work.	Cloth compares favorably with the regular work.	Cloth was much cleaner than regular work.	Cloth was very much superior to the work produced in any of the other tests; it had the appearance of combed work.

The foregoing experiments proved to us that single carding on the revolving flat cards is equal to double carding on the old American cards; but double carding on the revolving flat cards proved that the finished product was of a higher grade, because the cloth woven was much cleaner, with approximately the same loss in waste as on the old system of double carding; while, in the last experiment, semi-combing, with practically the same loss in waste, whether double carding on revolving flat cards or on the old American cards, or single carding on the revolving flat cards is considered, the breaking strength increased 7.38 pounds, and the cleanliness of the finished product was marked.

In a mill of 60,000 spindles, spinning No. 36s warp and No. 48s filling, the product would be approximately 55,450 pounds of yarn per week, and it would require, for the purpose of double carding this product 90 breaker cards, producing 765 pounds each per week, 10 doublers, and 110 finisher cards, producing 600 pounds, the total amount of machinery occupying 23,800 square feet, inclusive of proper working alleys, and consuming 275 h. p., with the labor of 13 card strippers at $117, 8 card grinders at $84, 8 card boys at $48, 5 doublers at $35, and 3 railway or drawing tenders at $18. Labor cost annually $15,704. On the other hand, a mill producing the same number of pounds of semi-combed yarn would require 75 cards producing 925 pounds, 60 combers producing 1,000 pounds, 10 sliver and 10 ribbon lap machines, occupying 19,000 square feet, including proper working alleys, and consuming 160 h. p., requiring the services of 5 card strippers at $45, 3 card grinders at $35, 3 card boys at $18, 8 lap machine boys at $60, 10 comber tenders at $80, and 2 fixers at $30. Labor cost annually $13,936. The first cost of equipment, therefore, of a semi-combed mill is parallel with that of the mill for double carding; the floor space saved is approximately 4,800 square feet, or about 20 per cent. The saving in power is 115 h. p., or about 40 per cent., and the annual saving in labor cost is about $1,768.

The result of the operation of a mill such as the above would be, as demonstrated by practical tests, the manufactured goods would be of a higher quality with the same grade of cotton; or, if an equal yarn only were desired, a much lower grade cotton or shorter staple might be used. A sixteenth of an inch saving in the length of the staple, or from two to three grades lower in the cotton would lessen the cost of the raw stock 75 points per pound. This would amount, in a mill with the production stated, to $487.50 per week, or the handsome total, annually, of $25,350.

The reason for this is that, in combing, the fiber is straightened out so much more than in double carding that the spinner is enabled to use a shorter staple, and yet obtain as fine a yarn as in double carding; whereas, should the same staple and grade of raw stock be used, the finished product would be far superior, and the work would run so much better in fly frames, spinning and weaving, that it would not only increase the production of the several machines, but would also make it feasible for the operators to attend a greater number, which would lessen to an appreciable extent the cost of production.

We have proved this theory by actual and practical tests, and invite your inspection of the finished goods which we have on exhibition in the room below, as well as of the machine in operation, combing 1,000 pounds per week, and taking out eight per cent. noils. We are combing hosiery cotton and also Egyptian and Sea Island cotton for spinning fine counts, and we are sure it will be to the interest of the gentlemen of this Association to make a thorough and careful examination of the machines which we present to you, of which, in the last three years, we have built and have in operation today, in some of the best mills of this country, more than one thousand; and this number does not include the machines which are being operated in other countries.

We also have on exhibition a machine in operation reclaiming good staple from waste, mixed in the following proportions: Fifty per cent. comber noils, and fifty per cent. card strips, taken from one and one-fourth inch cotton. Following is an estimate of the number of pounds taken from this waste, and we are prepared to prove to you, whether you are running carded or combed work, that we can reclaim from 55 per cent. to 70 per

cent. of good staple from card strips and comber noils on any of the classes of work we have mentioned; and in the finished product the results should be equal to carded work at the front of your breaker drawing frame, and on comber work equal to the stock put in the mix in the picker room.

ESTIMATE OF COST OF EQUIPMENT AND YEARLY PROFIT ON PLANT RECLAIMING 2,400 POUNDS OF CARD STRIPS WEEKLY.

Cost of Equipment		$4,200.00
5 per cent. on investment ..	$210.00	
5 per cent. for depreciation,	210.00	
2 per cent. for repairs	84.00	
Labor cost	400.00	
	$904.00	
Allowance of loss 40 per cent.; cotton recovered 60 per cent.		
Cotton recovered from flat strips for one year (52 weeks) at 1,440 pounds weekly, equals 74,880 pounds at 12 cents per pound (price of cotton originally)		$8,985.60
Sale of waste lost in reclaiming, figured at 40 per cent. for one year (52 weeks) at 960 pounds weekly, equals 49,920 pounds at 4 cents per pound		$1,996.80
Total		$10,982.40
Sale of flat strips as waste, if sold for one year (52 weeks) at 2,400 pounds weekly, equals 124,800 pounds at 5 cents per pound	$6,240.00	
Total cost of maintenance ...	904.00	
		$7,144.00
Net yearly profit		$3,838.40

This proposed estimate is figured on 12 cent cotton, allowing 5 cents per pound for strips sold. What you should do is to figure your price of cotton and the price you get for card strips into this estimate, together with the price you get for your comber noils in reclaiming strips, which we estimate at 4 cents per pound, and by so doing you find your net profit.

There is another way in which this reclaimed staple can be used in a combed mill. It may be mixed in the proportion of one can of reclaimed cotton to five of ordinary combed work at the back of the breaker drawing frame, and again mixing one can from the front of this frame at the back of the finisher drawing frame, making a mix of, say, one to twelve. In a well-known mill where we have run this mix, we have been unable to distinguish in the finished product the reclaimed staple from the original.

Again, where the manufacturer would prefer to mix this reclaimed cotton in his picker room, it can easily be accomplished by the application of an exhauster to the comber, which will take the sliver as it is combed, and deposit it in a bin prepared for this purpose in the picker room, separate from the cotton; and we would, in this case, advise either putting it in the mix as you would ordinarily clean waste, or running it through the breaker picker clear, making a lap which can be mixed in the ratio of one to four at the back of the intermediate and finisher pickers.

Care of Commutators.

T. E. CHAPPELL, 60 Wall St., New York City.

Too little attention has been paid in the past, among users of electricity, to the commutator. One does not have to travel far among electric plants to discover that commutators are operated under conditions detrimental to the life of the commutator and unfavorable to the economy of current.

Excessive sparking and the development of flats are believed, very generally, to be necessary evils, which must be endured, since they cannot be cured. Sparking wastes current and also "burns" the copper, thereby developing "pits," which further aggravate the sparking. By this process of softening the copper, "flats" are developed, which make it impossible for the brushes to get full contact with the surface of the commutator, hence defective commutation and loss in efficiency.

Besides the disintegration of the bars due to sparking and burning, waste of current, and loss of efficiency due to poor contact of the brushes, there is much trouble caused by increase of temperature of the adjacent parts of the generator, and particularly in the outboard bearings. Again the commutator will get so hot from bad brush contact that the solder in the lugs is often melted, causing the armature to show partial opening, which means a flat bar. This, if not remedied promptly, will extend to the next bar and so on around the commutator. There is also great danger of injuring the insulation and winding of the armature core, thus decreasing the efficiency of the unit and often necessitating rewinding the armature.

The fact is a whole troop of troubles in motors and generators are directly traceable to lack of knowledge of the commutator, or negligence in the care of it. The condition of the commutator determines the efficiency of the unit in service. A true periphery and a perfectly smooth surface are the two prerequisites to satisfactory service of the commutator.

To secure these is the aim of all commutator truing, and commutator truing devices. There are two methods now recognized in the truing of commutators. The tool and slide-rest has been long in use, and, supplemented by the "stone" and "sand paper," is familiar to everybody who has anything to do with commutators. The rec-

ognized defects of this device are: First, that the cutting-tool breaks the mica instead of cutting it, and drags the copper into these breaks. Second, on account of the different density of the mica and copper, this tool does not give a perfectly uniform surface, the copper bars being left a little higher in the center than the general level of the commutator. Third, this tool can be used only at low speed and therefore does not true the commutator as it runs in service. Fourth, it is necessary to take a thick cut with the tool to get the required "bite" for even cutting. Fifth, the tool must therefore be supplemented by a very constant use of stone or sand paper, and it is well known that these only exaggerate "flats." Sixth, on account of having to run the engine under the minimum head of steam while the governor is attached for the maximum speed, it is extremely difficult to maintain a uniform rate of revolution. It is not easy to prevent the tool digging into the bars under this uneven speed, and frequently great damage is done a commutator in this way. Again, the cutting wheel wears rapidly, and must be replaced by another or reground during the process of truing. When a tool is replaced in this way, a "score" around the commutator is always left, which can be removed only by taking another cut off the whole of the commutator. This results in a great waste of copper and so decreases the life of the commutator. Moreover, as the tools wear under the stress of cutting, you produce a taper which is very objectionable.

Grinding is the only present alternative to the cutting tool. A little reflection on the part of anyone familiar with machine tools will show that grinding by means of two revolving surfaces is almost the only way of securing a perfect periphery.

In the case of the commutator, the mica bars are of necessity ground to an even surface with the copper bars. There is no breaking or tearing of the mica and no dragging of the copper. The cutting wheel runs at such high speed as to make a perfectly clean cut of both mica and copper. It is only necessary to build a cutting wheel which will not fill with copper and which will afford the required cutting efficiency.

It was noted above that sparking and development of flats with the necessary consequent sanding and stoning, and periodical reducing, or turning down, are regarded as necessary evils, to be endured since they cannot be cured. But when you recall that the surface of the commutator is the point where delivery of power is effected, you see how important it is that these necessary evils should be abated; for, surely, with the price of coal doubled in the last five years, and threatening to double again in half the time, economy of current is increasingly necessary. Every point of leakage must be looked after. What percentage of the current generated is actually delivered to your machinery, is the question you are going to ask more sharply at every turn in the future.

On this question of percentage of power delivered to machinery, I am reminded of a youthful enthusiast who had been sent out to sell a certain turbine wheel. When asked what percentage of the power delivered to the wheel was actually communicated to the machinery he was stumped, not being informed on that phase of the subject of turbines. On being assured by his prospective customer that about 82 per cent. of power delivered was good, our young friend hesitated, but finally said with much assurance that he thought his turbine would deliver about 115 per cent. of the power to the machinery.

One cannot be quite so optimistic on the questoin of delivery of current by commutator, but it is certainly worth while, and I believe easily possible, appreciably to increase the efficiency of commutation and at the same time materially decrease the cost of the care of commutators.

Prevention is a word that is much in print nowadays and often heart on platforms, representing a wide variety of interests. We are told that it is much cheaper, as well as more humane, to prevent crime than to take care of criminals; cheaper and more humane to prevent poverty than take care of the poor; to prevent disease than to build and maintain hospitals. "An ounce of prevention is worth a pound of cure."

Actual experience with grinding has shown conclusively that the greater part of the commutator troubles discussed in this paper can be easily and cheaply prevented; that sparking, flats, imperfect brush contact, over-heating with the damage to bearings and armature windings, with attendant sanding and stoning, and periodical butchering with the tool, are not necessary evils. A small part of the time now spent in more or less fruitless efforts to remedy these commutator defects will prevent them altogether.

There are two types of commutator grinders now on the market. One type is driven by a separate motor with hand feed device for driving the grinding wheel across the face of the commutator; the other type is self contained, that is it is driven direct from the surface of the commutator by means of a rubber insulated friction wheel. This type is made up in both hand feed and automatic feed models. Grinding has passed the experimental stage, and it is not too much to say that the tool and slide rest must go the way of other once cherished and serviceable devices of antiquity.

The afternoon session opened with the paper on The Textile School,—Its Scope, by Charles H. Eames, director of the Lowell Textile School.

The Textile School.—Its Scope.

CHARLES H. EAMES, S. B., Principal Lowell Textile School, Lowell, Mass.

That the textile school occupies an important place in the development of the industry of this state and of this country is conceded. But I doubt if much thought concerning its scope or the extent of its field of development has been given by many members of this or any other association connected with the development of the textile industry or even by educational societies. That the field of textile manufacturing and its

allied branches is a comparatively restricted one; that it has been thoroughly studied and supplied with skilled men and minds, and therefore offers little opportunity for developing or applying new ideas; that it is not a lucrative field and offers little inducement to young men for advancement might be the belief of one unacquainted with the details of the business of manufacturing of textiles.

If one who is conversant with the processes and machines employed in the manufacture of even the simplest kind of cotton cloth, analyzes each process and machine for the purpose of determining the fundamental principles underlying each, he cannot help being impressed with the extent to which art and the various branches of science are applied. If he plans the addition to some process, the remodeling of some machine or the attachment to a machine, he realizes the importance of a command of the laws of these two great divisions of systematic knowledge in order to bring about a result which will be most efficient. Certainly no field of machine design has as many applications of the laws of mechanics as may be found in textile machinery. The laws governing the generation and transfer of heat, the application of the laws of light, particularly those referring to the mixtures of color in pigment, yarn or dyes, the extensive application of chemical laws are not only appreciated by thoughtful mill men but are deemed essential in developing the well-rounded, progressive man in the textile mill. The application of the dye or bleach, the washing and the dyeing all may be affected by the water or the chemicals held in solution, the soap and its composition exert a peculiar influence upon the finish of a fabric, the starch and other materials which are used in the sizing should be known to be of proper quality and quantity.

The need of greater economy in the generation of power demands an appreciative knowledge of chemistry coupled with an engineering training on the part of the mill manager. I think you will concede with me that it is possible for a manager to burn under his boilers almost as great a percentage of the dividends as might be made in the spinning and weaving departments.

If we go a step farther and consider the fine and decorative effects produced in or upon textile fabrics either by color or design or both, and consider the importance of art with a knowledge of its principles, theory and application in the textile industry, the place for the artist and practical designer becomes apparent. Their influence increases as the finer and higher class of goods are entered into, indeed the decorative art training or influence is really the leaven which permeates the whole and raises it to a higher and finer standard. Its effects may be either to develop original talent for the creation of new design or it may be to train and stimulate that appreciative talent so requisite in the selection of something not only to meet the demand of a changeable public taste but as far as possible to educate the public taste toward something higher and finer.

It is for the textile school to train young men to think clearly and broadly, to act with system and force, to develop themselves ready for the mill and shop which is to mould them to the highest efficiency, according to their particular demands and needs. The mill, shop and commercial world can do this part of the training far better than can any school. A certain part of the development can be best done in the school, a part can be done only in the practical world. It is not the idea of the school to attempt that which can be best taught by experience. A school cannot give experience. Do not understand this to be an argument for all theory and no practice in textile schools, far from it. The systematic acquisition of facts pertaining to the textile processes and machines can best be obtained in the school and this information can be given in conjunction with machine work as a means of developing the young man's mind and causing him to think and act for himself, or they can be taught as bare facts pertaining to a particular machine or process and the man becomes an automaton or a part of the machine in question. The latter can be produced in the mill, and if only such are wanted in the industry it is a question whether or not the textile school has a right for existence. The former cannot be produced in mills for there is usually no opportunity and few persons who are able to do it, or if able have not the available time.

The textile school has presented to it two types of young men. One type comprises those who can devote several years of continuous study to acquire a knowledge of the processes and machines, and who in general have had no previous acquaintance with textile work or material. The other type is composed of those who are at work daily in the mills, who have been obliged to spend much of their earlier lives at work but who have an ambition to rise and to improve themselves or acquire additional knowledge concerning their daily work. It is by training the latter that much can be done to improve conditions in the mill. While in general they do not come to the school with as good educational qualifications as do the day students, they do have a strong desire to acquire a fuller knowledge of their several duties and have what is often of greater value—determination and perseverance. There is much which can be done by giving them in a systematic manner the principles governing the machines upon which they work, or the process in which they are engaged. With their capital of technical knowledge, their perseverance and courage, they can aspire to, and secure some of the highest positions. The work of the evening school results in not only making the students more efficient in their work but prepares them to act as instructors to those who come under their charge. The school has therefore an ever widening field in training men who in turn will be teachers of the best kind for the operatives of the mills and shops.

The school tends to counteract in the mind of the strictly practical man the narrow influence which is bound to be felt by any one in a restricted line of work. It will help him to see the problems of another department and may show him the influence of good or bad work of his department upon the other. It helps to impress upon him the necessity of his own high efficiency.

It has a broadening and a restraining influence. It develops in him the powers which might otherwise lie dormant and helps him to put them to practical use. It is therefore educational in the truest sense. It is the drawing out, developing and making of economic value, the raw material of an untrained mind.

This was followed by a paper on The Advantage of Variable Speeds for Ring Frames by Albert Walton.

Advantage of Variable Speed for Ring Frames.

ALBERT WALTON, Boston, Mass.

We realize the magnitude of our proposition and its radical nature. We know that we are discussing a change in the gospel of the textile guild, a gospel that was three-quarters of a century old before we first turned its pages. We know that we propose a change that affects the major part of one of the largest industries of the world; that the volume and mass of the spinning and twisting machinery in this country alone is stupendous. You may, therefore, rest assured that we approach this task in no spirit of inconsidered enthusiasm. We know that not only is there momentum to this enormous mass of installed machinery, but no less is there momentum to the habits of thought of a mass of men. We also know that this very safeguard of conservatism may sometimes continue on its direct and accustomed way while conditions all about are changing unnoticed. But in this age all industries are related. We are all spun and twisted together into a single strand and each depends on each for assistance and success. It is, therefore, perhaps not unreasonable that one who is part of those changed conditions outside of your own immediate fraternity which yet bear upon your own conditions, may logically be considered as the proper person to bring these matters into the field of your own observation. It is on this basis that we are asking you to lay aside habits of thought, always a difficult but profitable thing to do, and to look upon this subject as though there had been no previous opinions formed. As in the selection of a jury, we ask you to be guided solely by the evidence presented regardless of previous personal opinion or prejudice. It is because we feel sure of this open minded consideration that we have ventured here at all.

In order that our discussion may be built upon a sound foundation of mutual understanding and agreement as to the precise meaning and scope of such terms as we may use, we are going to begin at the very bottom of the subject and ask your indulgence while we go over, for this purpose, some very fundamental facts. If, then, you will permit us to be tedious for a moment we will endeavor to atone for it later.

CONDITIONS MET ON EXISTING CONSTANT SPEED RING FRAMES.

Let us analyze the situation and see wherein the ring frame is defective, suggest a remedy and discuss the results of the application thereof. Fig. 1 is a crude representation of the producing parts of the usual ring frame, the rolls, the thread board and guide eye, the traveler, ring, bobbin and spindle with band and whorl. Fig. 2 shows two views looking down on the ring and spindle, "A" with the bobbin empty and "B" with the bobbin full.

The yarn moves from rolls to bobbin and is continually under tension. Whence comes this tension and what is its importance is our chief concern in this discussion. The power producing it comes to the spindle first of all through the band by way of the whorl. By this means the spindle is revolved at a fixed speed. The yarn, being attached to the bobbin on the spindle, of necessity must revolve with it, as must also the traveler through which it passes. Were the drawing rolls to cease feeding the yarn, it and the traveler must make as many turns as does the spindle. The yarn is, however, fed out by the rolls at a definite rate and yarn and traveler lag behind the bobbin and spindle by just so many turns per minute as will wind onto the bobbin the yarn that is being fed out. Since the speed of the rolls is constant and the diameter of the bobbin changes this lag in the traveler speed will vary somewhat, but for any practical purposes this variation may be ignored entirely.

The pull on our yarn, then, is imparted by the revolving bobbin. For a given weight of yarn and traveler and a fixed spindle speed, the pull is determined in amount and direction by five main items, namely:

1. The friction of the traveler.
2. The centrifugal force of the traveler.
3. The air friction of the yarn.
4. The centrifugal force of the yarn.
5. The diameter of the bobbin.

Before proceeding to a discussion of these various items, let us see what is the importance of this total pull on the yarn which these five items determine. The point most often overlooked is that this tension, to all intents and purposes, is the same from end to end of the stretch of yarn between rolls and bobbin. It is less from rolls to traveler than from traveler to bobbin only by so much pull as must be exerted to draw the yarn through the traveler, and this is a negligible quantity. In other words, the yarn runs so smoothly through the traveler that any tension put upon it at one end, follows along through the traveler practically undiminished to the other end. Herein lies one of the defects of the system. Obviously it is very desirable to maintain a uniform tension on the yarn at the point where it emerges from the rolls, for at this point the fibers are twisted only by the amount imparted in the preliminary spinning processes and even this twist has been so greatly reduced by the draft between the rolls that the cotton may be said to issue from the rolls as parallel untwisted fibers with little or no cohesion between them. It may readily be imagined that the yarn does not attain its full number of turns per inch until it is some little distance down on its way from the rolls to bobbin, even though the customary slanting of the rolls does not allow the twist to run freely up to the nip. The part nearest the rolls is, therefore,

weakest and subject to whatever drawing action there may be present. It is also the point where breakage is most likely to occur. Uniform tension is most desirable, therefore, on account of its effects here, although of importance throughout the entire segment of free yarn. We will consider many other advantages later, but the majority are traceable back to these features.

Let us revert to the five items which govern this tension and take them up in turn with a view to noting their variation during the winding of a complete bobbin of either warp or filling with the spindle revolving at a constant speed.

1. Friction of the traveler. The effect of the friction of the traveler is proportional to its speed. As we have noticed, its speed varies but an inconsiderable amount from the bare bobbin to the outside diameter of the wound bobbin and this we may therefore neglect in the present discussion.

2. The centrifugal force of the traveler. The centrifugal force of the traveler must be overcome by the yarn pull. Although this force varies as the square of the speed and its variation is, therefore, greater than that in the speed of the traveler upon which it depends, its total value from this cause is so slight that even a greater variation could be entirely ignored without detracting from the soundness of the calculation.

3. The air friction of the yarn. The same remark applies to the air friction of the yarn as related to the speed only.

4. The centrifugal force of the yarn. This force is even less than that of the traveler. The combination of these two yarn forces simultaneously with a variation in tension due to other causes is very complicated and may hardly be worked out in mathematical form. It brings into consideration the size and force of the balloon and the fanning action of the bobbin on which the yarn is being wound as well as that of its neighbors on either side. In general it is to be said that when the tension is great enough to hold the yarn down close to the bobbin, the stretch of unwound yarn is revolving in air which is being carried around with it by the fanning action of the bobbin, so that it cuts through relatively a small amount of air, whereas when allowed to fly out as a balloon it gets beyond the whirlpool caused by its own spindle and into the adverse eddies caused by the other spindles. In the latter case, centrifugal force and air friction increase simultaneously regardless of the speed of rotation. This tends to increase drawing tension which in turn tends to decrease the ballooning. So we may say other items have so much greater effect on the yarn tension than its own centrifugal force and air friction that these may be treated as of importance as related to these other causes, rather than to the variation in speed due to change in bobbin circumference.

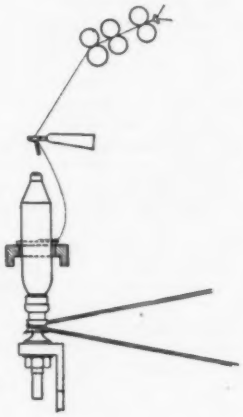


FIG. 1.

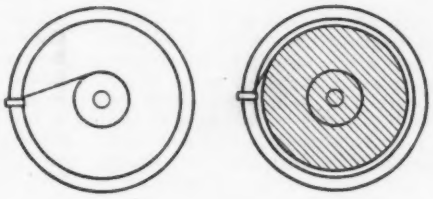


FIG. 2

5. The diameter of the bobbin. The most important effect would then seem to be that which is dependent upon the angle made by the yarn from traveler to bobbin. We have seen that for a given speed, traveler and yarn there is a definite set of forces which must be overcome. Two of these, the centrifugal force of traveler and yarn act radially and do not enter into this equation. The other two are frictions or dead resistances, "drags" as we call them—and act tangentially; that is, the pull to overcome them must be exerted around the circumference of the ring. These are nearly, though not quite, constant in value from wood to wound bobbin for warp or from nose to base for filling. Not so the pull put upon the yarn to overcome them, or it, for they may both be considered as one force and called the "traveler drag." To be sure, the force exerted in a direction tangent to the ring need only be constant to overcome this drag but, unfortunately, we cannot apply this force tangentially but are compelled to impart a tangential pull by tension along a short stretch of yarn pointing somewhat toward the center of the ring. If we pulled exactly toward the center we could not hope for any motion of the traveler around the ring, though we

might pull until the yarn reached the breaking point. We must pull somewhat to one side of the center and the further away from a central pull and the nearer a tangential we got the easier will be the overcoming of this tangential drag.

This, then, is in detail the condition which is met on every constant speed ring spinning frame. At the empty bobbin the force to overcome the drag must be exerted on a nearly radial segment of yarn whereas on a full bobbin of warp or at the base of a filling wound bobbin, the same drag is overcome by a nearly tangential pull. In both cases this pull is added to the steady pull of the cetrifugal forces. Obviously a much greater force must be exerted and therefore a greater tension put upon the yarn when near the empty than on the greater full diameters. This explains why more ends break in the first quarter or half of a set of warp bobbins than in the latter parts of the run and also throws a light on the breaking of yarn on the apex of a filling winding.

As a matter of fact this uniform increase from empty to full warp bobbin or from nose to base of filling bobbin does not appear to the writer to be the most advantageous method, although it is the one followed in our earlier experiments. Our first idea was that on account of the prevalent practice of "crowding" the speed at the empty bobbin we could better conditions by starting a little lower than present constant speed dictates, but it seems that the increased steadiness in rotative speed on a motor-driven frame was sufficient in itself to relieve conditions at the start so that a fair beginning may still be made at the present normal running speed of a constant speed frame.

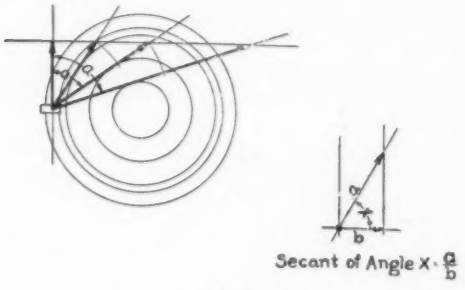


FIG. 3.

Keeping in mind that we are changing the speed because the conditions ease up as the direction of the yarn pull at the traveler becomes more nearly tangential, it might appear to follow that our speed variation should be governed by the relation between the tangential component and the total pull exerted. This tangential component on a constant frame is itself constant and the total pull to maintain this varies as the angularity of the pull decreases. But this change is more rapid for, we will say, the first sixteenth of an inch by which this bobbin is increased in diameter than by the last sixteenth. Our change in speed should therefore be made more rapid at first than toward the last. We should aim to increase our speed according to the same law that governs the decrease in tension in a constant speed frame in order that we may thus exactly counteract this falling off in the pull. As this total pull, other items remaining constant, varies approximately as the secant of the angle "a" in Fig. 3 (to use the trigonometric term) we have plotted what for want of a better name we have called "a curve of secants," the rise in speed being proportional to the falling off in total pull. If then we increase our speed according to this curve rather than in a straight line from start to finish we might expect to maintain a more truly constant tension and also effect still further gains in production at the same time. It will be noticed that the rise in speed is sharp at first and gradually flattens out as we progress so that at the last the speed increments are relatively very small. Inasmuch as we are dealing with varying practical machines and not a theoretically perfect laboratory device other items enter into the equation to disturb this ideal condition, so it is doubtful if the true curve of increase would after all exactly follow the lines laid down. An approximation to this is therefore all that it is wise to attempt. It will be found that if the pull is radial a lesser amount is required to overcome the tendency of the traveler to fly out against the ring than when it is nearly tangential. At the same time that our restraining influence is decreased our centrifugal force is increasing with the square of the speed. The traveler, if this rise be carried to excess, will rub on the ring with sufficient pressure to generate heat enough to result in its own destruction by fusion. This, therefore, is the determining factor in the case, and it can be determined only by practice and experiment in each instance, for it is affected by the weight of the yarn and the traveler and their relation to each other and by the amount of ballooning and the size of the ring and bobbin. A few trials with various sizes of travelers and different increments of speed will soon show what is the most satisfactory range to work upon.

In general, then, we believe that all that should be said is that experience seems to indicate that if we increase our speed uniformly from the start to the half bobbin and run at about that maximum speed from then till the doff, we will have a safe average from which to work out such refinements as each case may dictate.

Following this paper there was considerable discussion by Mr. James P. Tolman and Sydney B. Paine.

New members were elected as follows:

FOR HONORARY MEMBERSHIP.

Prof. A. Lawrence Lowell, LL. D., President Elect Harvard University, 171 Marlboro St., Boston, Mass.

FOR ACTIVE MEMBERSHIP.

Alexander E. Adam, Mgr. The Canadian Colored Cotton Mills Co., Ltd., 352 Macnab St., Hamilton, Ont.

George B. Adams, Treas. Adams Bros. Mfg. Co., Adams, Mass.

Joseph Barber, Treas. Barber Mfg. Co., 199 Perkins St., Lowell, Mass.

Stephen D. Bennett, Supt. Fitchburg Yarn Co., Fitchburg, Mass.
James Boothman, Asst. Agent Ayer Mills, Lawrence, Mass.
Nathaniel B. Borden, Jr., Treas. Barnard Mfg. Co., P. O. Box 748, Fall River, Mass.
William H. Buckley, Supt. Cornwall & York Cotton Mills Co., Ltd., St. John, N. B.
Heminway C. Bullock, Pres. Bullock Thread & Twine Co., Mgr. Ballou Yarn Co., Plympton, Mass.
Charles H. Kavanaugh, Pres. The Kavanaugh Knitting Co., Waterford, N. Y.
Frederick W. Cavanaugh, Sec. & Act. Treas. The Kavanaugh Knitting Co., Waterford, N. Y.
Roscoe L. Chase, Mgr. Arnold Print Works, 3 Elmwood Ave., North Adams, Mass.
John W. Coggeshall, Agent Riverside Mills, Olneyville, Providence, R. I.
Fred A. Cooley, Asst. Supt. Atlantic Mills, 140 Hamilton St., Providence, R. I.
Sidney Coolidge, Treas. Lowell Bleachery, Lowell, Mass.
George J. Crosier, Supt. Greylock Mills, North Adams, Mass.
Everett M. Cushman, Supt. Manomet Mills, 75 Campbell St., New Bedford, Mass.
John L. Duffy, Supt. Grant Yarn Co., Fitchburg St., Fitchburg, Mass.
Walter F. Field, Pur. Agent and Sales Mgr. Phillips Insulated Wire Co., 21 Park Pl., Pawtucket, R. I.
William Arthur Gallup, Agt. Arnold Print Works, North Adams, Mass.
C. C. Garland, Treas. Old Town Cotton Mill, Old Town, Me.
Bernard Greeff, Pres. Bentz System Co., 138 Spring St., New York City.
George T. Greenhalgh, Treas. Burgess Mills, Pawtucket, R. I.
Charles W. Hamblen, Treas. Fitchburg Duck Mills, 1 Brigham Park, Fitchburg, Mass.
William H. Harris, Supt. Slater Mfg. Co., Pawtucket, R. I.
Walter E. Hayward, Agt. Ipswich Mills, Ipswich, Mass.
Otto Hockmeyer, Fustain Converter Waterhead Mills, Waterhead Mills, Lowell, Mass.
Alvin Hunsicker, Sec. and Gen. Mgr. Standard Oil Cloth Co., 320 Broadway, New York City.
Ralph O. Ingram, Supt. Prospect Mills, Lawrence, Mass.
T. Nichol Johnston, Supt. Stark Mills, 686 Maple St., Manchester, N. H.
Timothy J. Kelly, Supt. Brighton Mills, 367 La Fayette Ave., Passaic, N. J.
John Leiper, Mgr. Weaving Dept., Salmon Falls Mfg. Co., Salmon Falls, N. H.
Charles A. Lumb, Vice Pres. Berry Spring Bleachery, Pawtucket, R. I.
John Warren Manley, Representative Sayles Bleacheries, 9 University Ave., Providence, R. I.
Albert G. Mason, Treas. Whitman Mills, New Bedford, Mass.
Peter McCarthy, Treas. Troy Knitting Co., Jacob and River Sts., Troy, N. Y.
Philip F. Nestel, Treas. Royal River Mfg. Co. (Yarmouth, Me.), Room 22, Cotton Exchange Bldg., New York City.
Townsend Palmer, Vice Pres. The I. E. Palmer Co., Middletown, Conn.
Philip M. Reynolds, Treas. Ipswich Mills, 19 Congress St., Boston, Mass.
Arnold B. Sanford, 2d, Supt. Yarn Dept. Utica Knitting Co., Erie St., Utica, N. Y.
John F. Shakelton, Supt. Pemberton Co., Lawrence, Mass.
C. B. Simpson, Mgr. Buckingham Mills Co., Ltd., Madras, India.
Albert G. Smith, Agt. Grant Yarn Co., Fitchburg, Mass.
Francis U. Stearns, Treas. Renfrew Manufacturing Co., Orchard St., Adams, Mass.
Albert W. Thompson, Mech. Supt. Amoskeag Mfg. Co., Franklin St., Manchester, N. H.
Albert H. Tillinghast, Treas. Grosvenor Dale Co, 17 North Main St., Providence, R. I.
Spencer Turner, Asst. to Gen. Mgr. Consolidated Cotton Duck Co., 86 Worth St., New York City.
Walter S. Williams, Pur. Agt. Arnold Print Works, 21 Hoosac St., North Adams, Mass.
Frank L. Worthy, Treas. W. Warren Thread Works, South Broad St., Westfield, Mass.
John H. Fallon, Supt. Danvers Bleachery, Danvers, Mass.
C. H. Hall, Mgr. Gibson Cotton Mills, Marysville, N. B.
Ernest E. Shelton, Asst. Supt. Tremont & Suffolk Mills, Lowell, Mass.

FOR ASSOCIATE MEMBERSHIP.

Day Baker, N. E. Mgr. General Vehicle Co., 84 State St., Boston, Mass.
Abraham Edgar Chernack, Mechanical Engineer Chernack Circular Loom Co., Chernack Braider Co., 64 Aspinwall Ave., Brookline, Mass.
Leonard W. Cronkhite, Treas. Industrial Starch Co., 367 Atlantic Ave., Boston, Mass.
Luther G. Goodrich, Representative Barber-Colman Co., 77 Washington St., North, Boston, Mass.
A. Thatcher Holbrook, Dist. Sales Mgr. Nernst Lamp Co., 607 Boylston St., Boston, Mass.
John S. Lawrence, member firm Lawrence & Co., 89 Franklin St., Boston, Mass.
J. W. Lindau, Chemical Expert Corn Products Refining Co., 26 Broadway, New York City.
Henry Marsh, with Richards, Atkinson & Haserick, 152 Congress St., Boston, Mass.
Preston Brooks Tobin, Charles Fairchild & Co., 29 Wall St., New York City.
Albert Walton, Commercial Engineer Westinghouse Electric and Mfg. Co., 716 Board of Trade Bldg., Boston, Mass.
Lawrence Whitcomb, Treas. and Gen. Mgr. National Brake and Clutch Co., 16 State St., Boston, Mass.
G. V. S. Michaels, Gusiem Spencer Co., New York.
Geo. R. Thurber, Asst. Treas. Textile Finishing Machinery Co., Providence, R. I.

The committee on resolutions asked that the following resolutions be adopted, which were carried unanimously:

The report of the Committee on Resolutions was presented to the association by the chairman, Edwin Farnham Greene, as follows:

"Resolved, That this Association extend to the Textile Exhibitors' Association and to their manager, Chester I. Campbell, a cordial expression of appreciation for their courtesy in inviting this Association to hold its meetings in this building, and that this Association also heartily commend their efforts in making possible an exhibit of textile machinery of interest and profit to our members and the public, and express the hope that this exhibit may be repeated at some future time.

"Resolved, That the thanks of the Association be extended to the following gentlemen who have addressed us at this meeting: His Excellency Eben S. Draper, Col. Albert Clarke, Prof. George F. Swain and T. E. Chappell.

"Resolved, That the National Association of Cotton Manufacturers, in annual session assembled, favors the passage of the cotton schedule substantially as proposed by the Finance Committee of the Senate, believing that it will assist in producing the needed increase in revenue, continue reasonable remuneration to American labor and capital and encourage the development of the industry which will increase the consumption of American grown cotton, a large proportion of which is now exported for foreign manufacture.

"Resolved, That the secretary send a copy of this resolution to the chairman of the Finance Committee of the Senate, and to the chairman of the Ways and Means Committee of the House of Representatives.

"Resolved, That the report of the committee on standard specifications for staple gray goods, defining allowable variations from nominal specifications of width, count and weight be adopted and approved by this association, and that the Board of Governors be given power to act for this association in accepting any changes deemed necessary and recommended hereafter by the committee.

"Resolved, That the report of the committee on standard specifications for staple gray goods, recommending a form of contract sales note for staple gray goods, be adopted and approved by this association, and that the Board of Governors be given power to act for this association in accepting any changes deemed necessary and recommended hereafter by the committee.

"Resolved, That the committee on standard specifications for staple gray goods be continued, or reappointed, with a view to fostering the practical recognition of the specification standards recommended in its report, and the practical use of the sales note form, as well as to recommend any changes to the Board of Governors that may be found necessary, or advisable, as a result of practical use."

In acknowledgment of the renewed courtesy shown by the Museum of Fine Arts for its hospitable invitation to visit its collections, the National Association of Cotton Manufacturers wish to express its thanks for the valuable privilege afforded by examination and study of its extensive collection of textiles. It is certainly hoped that these opportunities for critical analysis of notable designs will in turn furnish inspiration resulting in improvements in the product of the textile industry in all that ministers to higher standards of taste.

"Resolved, That this association heartily indorse the action taken by the Board of Governors as set forth in the following vote of March 6, 1909:

"'Whereas, Extensive improvements in transportation facilities are urgently necessary to meet the demands of future traffic, and a hostile attitude in any of our state legislatures would tend to make railroad managers hesitate to undertake large plans for accelerating freight movement; therefore be it

"'Resolved, That the Board of Governors of the National Association of Cotton Manufacturers urges legislators to ascertain carefully before adopting new restrictions upon railroads whether they will imperil earnings or interfere with the progressive development of facilities.'"

Mr. Tolman raised the point whether the resolution relating to the endorsement of the tariff schedule was strictly within the province of the association which had hitherto confined itself more particularly to technical subjects. Chairman Greene explained that the board of directors had already passed on this point and thought that its importance to the industry warranted the adoption of the resolution, and Mr. Hobbs called attention to the fact that on previous occasions the association had passed resolutions in regard to matters not relating to technical mill subjects, but otherwise affecting the industry. Mr. Tolman withdrew his amendment and all the resolutions were carried unanimously.

The election of officers resulted as follows:

President: Charles T. Plunkett, Adams, Mass.

Vice Presidents: George Otis Draper, Hopedale, Mass.; Franklin W. Hobbs, Boston, Mass.

Directors for three years: George P. Grant, Jr., Fitchburg, Mass.; Edwin Farnum Greene, Boston, Mass.; David S. Johnston, Cohoes, N. Y.

President Plunkett made a few appropriate remarks of thanks for the honor of reelection and promised his best efforts for the welfare of the association during the coming year. While the balloting was in progress Henry D. Martin of Clinton, Mass., read his paper on the Proper Care of Machinery, saying in part as follows:

The Proper Care of Machinery.

HENRY D. MARTIN, Clinton, Mass.

The equipment of machinery in any modern cotton mill, represents a vast deal of capital, but its true value after being in operation a few years, is quite another consideration, depending, of course, a good deal on the age and the care it has received. Machinery, like most anything else, deteriorates in efficiency, and therefore, in value, but faster on account of improper care than on account of the length of time it has been in service.

First, it wears out, naturally or unnaturally, beyond a point where it is economy to use it. It may wear out unnaturally, or in other words, too fast or unreasonably, on several accounts, possibly for want of proper oiling or because of improper adjustment of the working parts. It may wear out too fast on account of over-speeding, also, because of being roughly handled by the help, and not being kept clean. Overloading the machinery with work not adapted to same will shorten its life. So will manufacturing from poor stock. Among other things that cause great wear and tear of machinery, may be mentioned belting, and banding it too tightly; also the use of inferior iron and steel in its construction, and unskilled or poor workmanship in building it.

The same can be said of machinery that is allowed to stand idle and rust away. Even good machinery, like a good man or a trotting horse, needs exercise to keep it at its best. So we have, at the least, twelve causes given to show how machinery may wear out, viz: The natural wear and tear which cannot be avoided and the eleven other causes given that can be avoided. We are all agreed that machinery in charge of intelligent and skilled men should never be allowed to wear out for want of oiling; for want of proper adjusting; proper cleaning; proper speeding; or proper handling by the operatives, etc.; and yet there have been new mills in operation, right here in New England, that had not run five years before the machinery showed marked unnatural wear because of improper care. The same can be said of some new mills that were started in the South some years ago. As this is really so, and so many new mills are now being built, a paper on this subject calling attention to the remedy for this evil, may prove of some value to our Association.

In starting a new mill, great care should be taken to select a superintendent who not only knows the processes, and how to manage help, so as to produce a maximum production of the right quality, at a low cost, but it is also highly essential that he should be one who also knows his duty with reference to taking proper care of the machinery. In starting a new mill the common help should be carefully selected, and each hand trained to properly oil, clean, and not to use the machinery roughly. What is meant by using the machinery roughly is, that some of the help become careless and bang things around as though they were playing foot-ball. In cleaning around machinery when they are not careful to stop the machines as they should; in wiping or brushing certain dangerous places, they let a brush, broom, or waste get caught and injure the machinery. In moving up and down in the alleys, between the machines, people often run into the sides or against the ends of same, breaking parts and driving the machinery out of line.

Spindles on roving machinery, spinning frames, twisters, spoolers and on other machinery, become bent by pulling at them sidewise. Fluted steel drawing rolls, on all machines thus equipped are the most shamefully abused parts of any machine in the mill. The help if not well trained, cautioned and watched on these things, will use knives, steel hooks and even an iron weight or hammer to remove waste that has been wound onto the rolls when the ends have broken. (Only soft brass wire hooks should ever be used for this purpose.) Some mills are running badly today and are making much bad work on this account. Show us a mill where the machinery has been well cared for by a good organization from the start, and we will find plenty of good help, good running work, plenty of production coming off at a low cost, and a contented organization all the way through, because all are giving good results and getting a better income for the mill and for themselves. This important matter makes a vast difference in the earning capacity of a mill, as you all know. This paper is not intended to cover the entire field of the subject. Time is too limited for that. It is only intended to open the subject for discussion, if desired, as it is an important subject, and there is much more to it than can be told in a brief article of this kind.

It is a fact too that machinery needs a rest, a vacation as it were, same as the workers do. A machine that is run continually day and night for example, cannot last so long as when it is operated the same length of time by day time only; and the men who have discovered this advantage are today getting the highest productive efficiency and the cream of good work. It repays handsomely to stop a machine periodically and thoroughly overhaul it, cleaning every part and resetting or readjusting everything. This kind of a halt, like a frame stopped to doff, is a revenue bearing one and is as necessary. A wise manager never finds fault when he sees a machine stopped and being put into perfect order to run another race. He does not do as an uninformed stockholder did once.

Some time ago a stockholder not familiar with mill work and being anxious about his investment, was being escorted through the mill, when he saw a frame stopped to doff. Said he, "What is this stopped for?" "Stopped to doff!" said the section hand. To which the over-anxious investor replied, "Now, young man, you want to keep these machines running and never let this thing happen again. This doffing business will ruin us!"

The fixers must also be taught to do their part. They also have an important part to play in this matter. They should not use a sledge hammer where a tack hammer would answer the purpose. They should adjust the different working parts so that each machine works freely and under the least strain. This saves oil and power as well as

the machinery. It also saves labor, help, and gives a longer productive run. It also makes evener work as well as more of it. Keeping the machinery clean will do the same things just mentioned. Keeping the machinery level and in line is another economical point to bear in mind all the time. It is false economy to let machinery go for several years without leveling and lining it, in fact, it is well known by mechanics that a machine which has not been leveled for years, if leveled, it will not run. Everything binds. It must be kept level all the time. Again, the matter of speed enters this problem. It is a fact that when some good managers take charge of a mill the first thing they do is to slow down some of the overspeeded machinery; and immediately they get off a larger production and a better grade of work than previously. What does this mean? This also means less power going to waste, less wear and tear of the machinery and more contented workers, because even the larger production of a better quality is more easily secured than the poorer production on the higher speed at times when it is overspeeded. Tight belts are another source of many troubles. Oftentimes the friction load may be 25 to 50 per cent. more than it should be on this account. Reducing the strain of belts assists in a large measure to maintain the advantages just specified.

Again, machinery deteriorates in efficiency and value because it becomes too old to compete with modern improved machinery. This time is bound to arrive, sooner or later, according to the progress of the machine shops. However, old machinery that has had good care, kept in first class repair, and latest improved mechanisms applied, when possible, from time to time, will give a long chase before becoming wholly unprofitable to operate. Although the old equipment may be in good running order, it is well too, not only to watch the repair account, but it is well to consider what the loss is in operating old machinery, and compare the figures with the much greater advantage of replacing same with modern machinery altogether. There comes a time when it is folly to operate an old machine when a new one would rapidly pay for itself and soon be giving dividends that the old equipment could never bring. It is false economy to repair a machine beyond the economical range. This can be illustrated by a young man who had carried a jack knife for some time. It had often been repaired. Finally he showed this knife to his friends and he asked them if it was the same old knife and at once the house divided. Some said it was the same old knife, while the rest declared that it was a new one. Whereupon he got all the old parts, put them together and produced another knife, and he found that he had neither the old knife nor a new one. The best knife he had was a patched-up mess of a job, and it cost him more to put it together by so much intermittent repairing than what he would have had to pay for three good brand new knives. It would have paid him to throw away the old knife in an early stage of the repairing. And so it is with machinery. Take good care of the old machinery, so long as it is worth the care. After that buy new machinery and scrap the old. It is advisable to have a good system of inspection that will eliminate the possibility of machinery being neglected in any department of the plant. Any system of thorough inspection that can prevent this is commendable. The modern, well managed plant calculates to avoid every possible disaster, always bearing in mind the principle that an ounce of prevention is worth a ton of cure. To this end the power plant units not only undergo constant watchfulness, but a weekly thorough inspection is made of these units, together with every main driving arrangement until the entire driving gear and remotest counter belt in the plant is inspected. The entire aim is to avoid having any kind of a breakdown, and have the mill run solid time, year in and year out. Many mills accomplish this to their great credit. Apply this same eternal vigilance to the entire force of overseers, second-hands and section men. Institute in the minds of all these men the value of being on the everlasting daily lookout, to prevent any possible neglect here and there. Have these men take time to kindly train their help to take pride in doing their part, and never to neglect reporting the slightest irregularity about the movements of their respective machines. In this way many lesser and more disastrous breaks are prevented. And then every man of responsibility should make his own thorough inspections to satisfy himself that things are being attended to all along the line. The whole idea being to give every individual machine solid running time so far as possible. A good system is to number each machine in the mill and keep the repair account of each separately.

Secretary Woodbury brought the proceedings to a close by telling what had been done in preparing a bibliography of the cotton manufacture. His paper on the subject was not read in full, but he told the story of the work and asked the cooperation of members in making it still more complete. He said in part as follows:

Bibliography of the Cotton Manufacture.

C. J. H. WOODBURY, Sc. D., Boston, Mass.

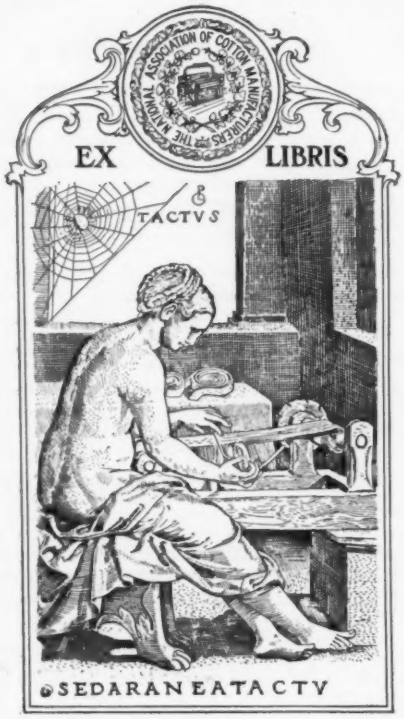
This scene is a copy of "The Weaver," by Georg Penz (Nuremburg 1530), and is the earliest known engraving on a textile subject. The motto "sed aranea tactu" (but the spider is delicacy of touch), is the last portion of a Latin couplet, parts of which were used as titles to his five engravings on the senses.

"Truxa per auditum, linx visu, milvus odore,
Simia nos superat gustu, sed aranea tactu."

Which may be translated as: Wild animals excel us in hearing, the lynx in sight, the vulture in smell, the monkey in taste, but the spider in delicacy of touch.

The citation of this couplet has not as yet been found.

The Association is constantly receiving requests for information upon books relating to the manufacture of cotton or to its tributary subjects, many of these inquiries being of importance to the interests of such members.



The card catalogue of the Transactions contains about 25,000 references, but beyond this there does not appear to be any bibliography upon the subject, notwithstanding the importance of the industry, and it has been generally difficult and frequently impossible to either answer these inquiries or to give any reference where this information can be obtained.

It was decided that before the Association could take any steps towards the systematic formation of a library, it would be necessary to ascertain what books were available from which to make a selection and the income from the bequest of George W. Weeks was applied to this purpose.

A circular letter was issued to the members and to libraries believed to have collections on textiles, asking for titles of such books with names of authors, publishers, locations and dates. The response has been most cordial, bringing, it is estimated, over 12,000 titles in reply, including many references to addresses and articles in magazines containing some of the most valuable contributions to the cotton industry, which could not otherwise have been found without extensive search.

Many private libraries far exceed the collections of any of the textile schools, and this fact is mentioned to call attention to the desirability of providing suitable textile libraries for such institutions, as it is frequently only through the privileges of libraries that the state of any branch of the textile art can be learned and useless labor of duplication be avoided.

The present number of citations is about 4,000, and in the case of references to several editions, the earliest has been noted.

Especial thanks should be given to the technical departments of the Federal Government which have furnished citations of the books pertaining to the subject in their libraries.

The British Patent Office sent a list of their books which were of great value to this work.

This preliminary copy is issued subject to correction and the writer will cordially appreciate further cooperation by information of any omission or error to be corrected in the final copy before it is included in the Transactions, and more especially the contribution of further data of author, title, publisher, place and date of any books which have been omitted.

Titles are not only similar, but in many cases identical, so that the only means of arrangements has been the names of authors, except in the case of anonymous books.

No attempt has been made to present a complete list of books on engineering and economics which may apply to problems coming before those engaged in cotton manufacturing, but merely to cite those which have been found to be helpful.

The titles have been classified into the following divisions, which contain subordinate subjects in alphabetical order as follows:

I. Cotton Manufacture:—Carding, combing, cotton fiber, designing, knitting, lace manufacture, microscopy, netting, picking, singeing, slashing, spinning, static electricity, twisting, stretching, warping, weaving, yarn tables.

II. Finishing:—Bleaching, conditioning, drying, dyeing, mercerization, printing, receipts, waterproofing.

III. Engineering and Machinery:—Accidents, belts, boilers, chimneys, concrete construction, fire protection, flow of water, fuels, heating, humidification, illumination, lubrication, mill construction, preservation of timber, rope driving, specifications, steam engines, steam turbines, textile machinery, transmission of power, transportation in mill yards, ventilation, water wheels.

IV. History and Economics:—Administration, associations, biographies, commerce, costs of manufacture, history, labor, manufacturing accounts, patents, reports on expositions (not included elsewhere), statistics, taxation, textile education, valuation, welfare work.

V. Cotton:—Bagging materials, baling, brokerage, calculators, cotton exchanges, cultivation, gathering, ginning, grading, linting, packing, pests, price tables, shipping, tare, trade, trade tables.

VI. Journals:—Textile dictionaries, textile directories, textile periodicals.

Recent Textile Patents.

COTTON PRESS and Feeder. Automatic. 917,754. Frederick B. Cumpston, Blooming Grove, Tex.

DYEING APPARATUS. 918,485. Thomas Allsop and Walter W. Sibson, Philadelphia, Pa.

DYEING APPARATUS. Yarn. 915,939. Cesar Corron, St. Chamond, France.

DYEING MACHINE. 918,767. Chas. J. McNamara, Philadelphia, Pa.

DYEING MACHINE. Circulating. 918,484. Thos. Allsop and Walter W. Sibson, Philadelphia, Pa.

FABRIC. 918,683. George A. Lowry, Boston, Mass.

FABRIC-BEETLING Machine. 918,668. Harry Gray, Rawtenstall, England.

KNITTING MACHINE. Circular. 917,989. Wm. T. Barratt, Bennington, Vt.

KNITTING MACHINE Stop Mechanism. 916,094. David T. Berlizheimer, Philadelphia, Pa.

KNITTING MACHINE. Straight Bar. 916,492. Bruno Salzer and Gustav Walther, Chemnitz, Germany.

KNITTING-MACHINE Yarn-changer. 916,966. George E. Babcock, Fort Plain, N. Y.

LOOM for the Manufacture of Tufted or Pile Fabrics. 915,853 Thomas Greenwood, Wolverley, near Kidderminister, England.

LOOM for Weaving Tufted or Chenille Fabrics. 916,077. Fred A. Whitmore, Philadelphia, Pa., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM FILLING Fork Grid. 916,617. Wilfred L. Scott, Hopedale, Mass., assignor to the Draper Co., Hopedale, Mass.

LOOM HEDDLE. Wm. H. Hartley, Fall River, Mass.

LOOM PATTERN Mechanism. 917,088. Wm. J. Lutton, Paterson, N. J.

LOOM Harness-leveling Mechanism. 915,916. Adolph Widmer and Samuel Widmer, Paterson, N. J.

LOOM. 918,801. Franz L. Waechtler, Grossenhain, Germany.

LOOM ATTACHMENT. 919,023. Solomon Kenrick, Rochester, N. Y.

LOOM Center-filling Stop Motion. 917,644. Benjamin F. McGuiness, Worcester, Mass.

LOOMS. Means for Facilitating Warp Change in. 916,596. Alonzo E. Rhoades, Hopedale, Mass., assignor to the Draper Co., Hopedale, Mass.

LOOM for Weaving Cut Pile Fabrics. 918,371. Frederick W. Rochelle, Philadelphia, Pa.

LOOM. Narrow-ware. 917,435. Elbridge R. Holmes and Irving H. Verry, Worcester, Mass.

LOOM TAKE-UP Mechanism. 12,944. Thomas Nevin, Lowell, Mass.

LOOM SHUTTLE. 918,123. Henry M. Brown, Providence, R. I.

LOOM SHUTTLE. 916,415. Arthur Buckler, Philadelphia, Pa.

LOOM SHUTTLE Box-operating Mechanism. 918,430. George M. Foster, Manchester, N. H.

LOOM STOP Motion. 917,817. Daniel Ward, Paterson, N. J.

LOOPER TRIMMER. 916,799. William J. Steere, Rockwood, Tenn., assignor of one-half to James A. Huff, Rockwood, Tenn.

LOOM Weft-replenishing Mechanism. 916,362. Felix O'Donnell, Pawtucket, R. I.

SILK FILAMENTS. Apparatus for Lustering and Finishing. 916,367. Edward Pohl, New York.

SPINNING FRAMES. Disintegrating and Delivering Magazine for Travelers for Ring. 917,086. Alfred A. Lovejoy, Lowell, Mass.

SPINNING or Twisting Machine. 916,977. Herbert G. Beede, Pawtucket, R. I.

WARPS. Arranging for Tension and Let-off of. 917,682. Sakichi-Toyoda, Shimasaki-Cho, Nagoya, Japan.

Recent Textile Trade-marks Registered.

"Etone." Silk cloth. Fred Moss, New York.

"Chippewa." Blankets, flannels and woolen piece goods. The Mandelert Mercantile Co., Chippewa Falls, Wis.

"Society Brand." Men's, boys' and children's coats, vests, etc. Alfred Decker & Cohn, Chicago, Ill.

"Emerge." Woolen and worsted knitted and piece goods. The Southwark Mills Co., Philadelphia, Pa.

"Sovereign." Cotton plaids and checks. Riverside Cotton Mills, Danville, Va.

"Riverside." Cotton plaids, checks, cheviots, chambrays, etc. Riverside Cotton Mills, Danville, Va.

"Hartford." Cotton plaids and checks. Riverside Cotton Mills, Danville, Va.

"Dan Valley." Cotton plaids and checks. Riverside Cotton Mills, Danville, Va.

"Armenia." Cotton plaids and checks. Riverside Cotton Mills, Danville, Va.

"La Vogue." Ladies' outer suits, skirts, and coats. The John Anisfield Co., Cleveland, O.

"Salon Beauty." Ladies' underskirts. Schiff & Bloom, Baltimore, Md.

"Dreadnaught." Hosiery. Cooper, Wells & Co., St. Joseph, Mo.

"Wooltex." The H. Black Co., Cleveland, O.

"Lone Star." Overalls, jumpers, coats, etc. Sanger Bros., Dallas, Tex.

"Rexall." Absorbent cotton. United Drug Co., Boston, Mass.

"Hesper." Cotton dress goods. L. Hess & Co., New York.

"C. S. M." Broad silks. Leerburger & Hesslein, New York.

C. E. RILEY COMPANY

65 Franklin Street, .. BOSTON, MASS.

COTTON AND COTTON GOODS YARNS

DIRECT IMPORTERS OF EGYPTIAN COTTON

COTTON WOOLEN WORSTED MACHINERY

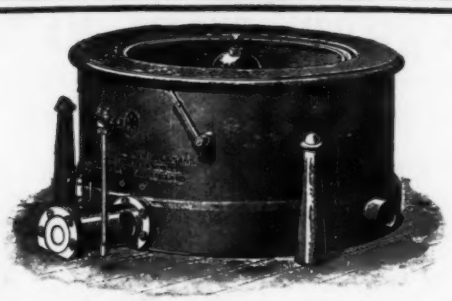
Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

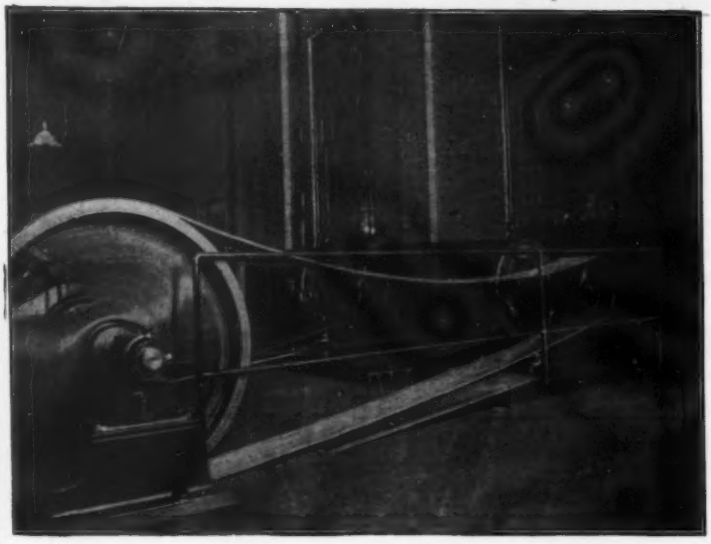
OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



SUSPENDED ON LINKS. REQUIRING NO EXPENSIVE FOUNDATIONS

C. E. RILEY COMPANY, Sole Agents 65 Franklin St., Boston, Mass.

Machines Kept in Stock in Boston



Static Electricity In Belts

This belt is an example of the way Cling-Surface will stop generation of static.

It was full of static, running tight and slipping more or less.

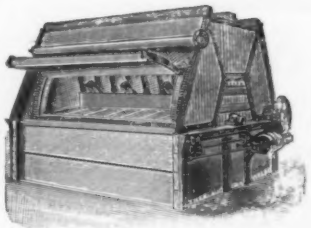
Cling-Surface stopped the slipping so belt could run slack and gave the soft, velvety face which Cling-Surface produces.

Static stopped at once and you note the chains, formerly used for grounding, pushed aside.

Cling-Surface will prevent static in every belt or rope you run, no matter what weather conditions are and we guarantee it. Write us or try at our risk.

CLING-SURFACE COMPANY 1051 Niagara Street BUFFALO N Y

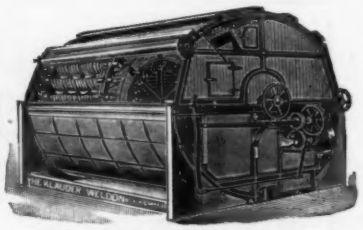
NEW YORK BOSTON ATLANTA MEMPHIS, Etc.



RAW WOOL AND COTTON MACHINE.

MACHINES sold on 2 MONTHS' TRIAL

YOU TAKE NO RISK

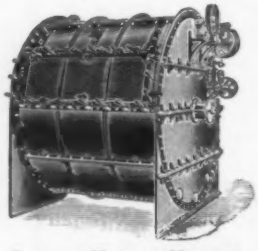


SKEIN AND SLUBBING MACHINE.

THE KLAUDER-WELDON DYEING MACHINE COMPANY

HUDDERSFIELD, ENGLAND. *AMSTERDAM, N. Y.*

Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins—Slubbing—Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.

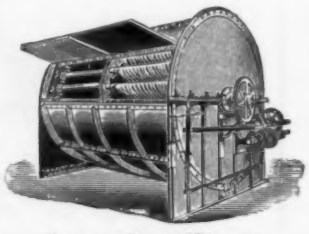


SULPHUR HOSIERY MACHINE.

Special Machines for Sulphur Colors

WILL EARN THEIR COST IN LABOR ALONE IN FROM 6 TO 12 MONTHS ACCORDING TO CAPACITY

Southern Agent, O. A. ROBBINS, Charlotte, N. C.



SULPHUR SKEIN MACHINE.

Buyers' Index

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.
Carrier Air Conditioning Co. of America.
Cramer, Stuart W.
Fries, John W.
Parks, G. M., Co.

Architects and Mill Engineers.
Dean, F. W.
Ferguson, John W.
Cramer, Stuart W.

Asphalt Tanks.
Scaife, W. B., & Sons.

Automatic Feeds for Cotton and Wool.
Bates & Robinson Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Bale Ties.
Acme Steel Goods Co.
Reliable Tie Co.

Baling Presses.
Boomer & Boschert Press Co.
Philadelphia Drying Mchy. Co.
Minnich Machine Works.

Bandings.
——See under Yarns.

Baskets.
Lane, W. T., & Bro.

Beams (Steel).
Mossberg, Frank, Co.

Bearing Metals.
Dodge Mfg. Co.

Belting.
Boston Belting Co.
Burnham, E. E., Co.
Gandy Belting Co.
Graton & Knight Belting Co.
Rhoades, J. E., & Sons.
Schieren Co., Chas. A.
Shultz Belting Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Schieren, Chas. A., Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Machine Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Buhlmann, A. W.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Carbondale Calcium Co.
Danker & Marston.
Roessler & Hasslacher Chemical Co.
Siemens & Halske.

Blowers and Blower Systems.
American Blower Co.
Cameron Machine Co.
Dean Bros. Steam Pump Works.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.
Sirocco Engineering Co.

Bobbins, Spools, Shuttles, Etc.
American Supply Co.
American Textile Specialty Mchy. Co.
Buhlmann, A. W.
Leigh, Evan A.
Lestershire Spool & Bobbin Co.
Mossberg, Frank, Co.
Tebbets, E. L., & Co.
Wilson & Co.

Bobbin Winders.
Lever, Oswald Co.
Universal Winding Co.

Boilers.
——See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Box Strapping.
Acme Steel Goods Co.

Braiding Machinery.
Mason Mfg. Co.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass Hinges.
Root, C. J., Co.

Bridges.
Scaife, W. B., & Sons.

Brushers.
——See Napping Machines.

Brushes.
Felton, S. A., & Son Co.
Mason Brush Works.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Taunton-New Bedford Copper Co.
Textile Finishing Mchy. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.

Caps.
Calder Machine Works.

Carbonizing Machinery.
Birch Bros., Somerville Machine Wks.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schuchardt & Schutte.
Tolhurst Machine Works.

Card Clothing.
Ashworth Bros.
Bates & Robinson Machine Co.
Buhlmann, A. W.
Crabb, Wm., & Co.
Howard Bros. Mfg. Co.
Leigh, Evan A.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Carded Cotton.
Blaisdell, S., Jr., Company.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Riley, C. E., Company.
Smith & Furbush Machine Co.
Richards, Atkinson & Haserick.

Carders' Tools.
Brown, Wm. H., Co.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Castings.
Farrel Foundry and Machine Co.
Schofield, Wm., Co.

Cell Driers.
Cell Drier Machine Co.

Cement Pans.
Scaife, W. B., & Sons.

Chemicals.
Harding, Fancourt & Scull.
Roessler & Hasslacher Chemical Co.

Chemists.
Little, Arthur D.
McKenna, Dr. Chas. F.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Nanz, T., Clock Co.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Richardson Brothers.

Cloth Cutting Machinery.
Adams, A. L.
Cameron Machine Co.

Cloth Expanders.
American Finishing Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas, & Co.
Textile Finishing Machinery Co.

Cloth Testers.
Scott, Henry L., & Co.

Clutches.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.
Mossberg Wrench Co.

Coal.
Darrow Mann Co.

Combs (Wool and Cotton).
Hood, R. H., Company.
Jefferon, Edward, & Brother.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Condensers.
Dean Bros. Steam Pump Works.

Conditioning of Textile Fabrics.
New York Silk Conditioning Works.

Conveying Systems.
Dodge Mfg. Co.
Schnitzler, C. H.
Sturtevant, B. F., Co.

Cop Machinery.
Eppler, John, Mach. Works.

Cop Spindles.
American Textile Specialty Mchy. Co.
Hall, F. A., & P.

Cop Tubes.
American Textile Specialty Mchy. Co.
Buhlmann, A. W.
Hall, F. A., & P.
——See Paper Tubes.

Copper Print Rollers.
Taunton-New Bedford Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.

Copper Work for Dyers.
Badger, E. B., & Sons Co.
Butterworth, H. W., & Sons Co.
Harrington & King Perforating Co.
Textile Finishing Machinery Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Alphabetical Advertising Index, with page numbers, follows this list.

Cotton Machinery.
Aitemus, Jacob K.
American Textile Specialty Mchy. Co.
Ashworth Bros.
Bates & Robinson Machine Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cramer, Stuart W.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Dixon Lubricating Saddle Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Haskell-Dawes Machine Co.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kip-Armstrong Co.
Kitson Machine Co.
Klauder-Weldon Dyeing Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
McKerrow, H. G., Co., Ltd.
Metallic Drawing Roll Co., The.
Palmer, I. E., Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Stafford Co., The.
Textile Finishing Machinery Co.
Textile Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Cotton Softeners.
Bosson & Lane.
Burckhardt & Co.
Danker & Marston.
Harding, Fancourt & Scull.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.
Schofield, Edwin F.

Counting Machines.
Root, C. J., & Co.
Schuhardt & Schutte.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Creosote.
Carbolineum Wood Preserving Co.

Cutting Machines.
Adams, A. L.
Cameron Machine Co.
Oswego Machine Works.

Cylinder Oil (Superheated Steam).
Power Specialty Co.

Dobbies.
Crompton & Knowles Loom Works.
Kilburn, Lincoln & Co.
Stafford Co., The.

Dobby Chain.
Nuttall, George.

Doupe Cutters.
Cameron Machine Co.

Draughtsmen.
Cameron Machine Co.

Drawing Rolls.
Jefferson, Edward, & Brother.
Hood, R. H., Company.
Metallic Drawing Roll Co., The.

Drying Machinery.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Edward, & Brother.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Drying Boards.
Bull, William C.
Pearson, J. T.
Philadelphia Drying Mchy. Co.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
American Blower Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Davidson, J. F.
Firth & Foster Co.
Globe Dye Works Co.
Home Bleach & Dye Works.
Hopkinson Dyeing & Textile Works.
Lorimer's, The Wm. H., & Sons Co.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Rowland, Samuel.
Solway Dyeing & Textile Co.
Utica Willowvale Bleaching Co.
Western Thread & Dye Works.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co.
American Laundry Mchy. Mfg. Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Gessner, David.
Heathcote, John, & Son.
Hopkins Machine Works.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh, Evan A.
Leyland, Thos., & Co.
National Laundry Machinery Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rodney Hunt Mach. Co.
Schwartz, L. H. A., & Co.
Schuhardt & Schutte.
Smith, Drum & Co.
Sturtevant, B. F., Co. (Drying).
Taylor & Fenn Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Trucks.
Bailey, Frank.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.
Klauder-Weldon Dyeing Machine Co.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Arabol Manufacturing Co.
Atteaux, F. E., & Co.
Badische Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Carbondale Calcium Co.
Cassella Color Co.
Danker & Marston.
Farbenfabriken of Elberfeld Co.
Kalle & Co.
Ford, J. B., Co.
Geisenheimer & Co.
Jamaica Dyewood & Chemical Co.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Metz, H. A., & Co.
Roessler & Hasslacher Chemical Co.
Stein, Hirsch & Co.
Sykes, Walter F., & Co.
Thayer, Ed. M., & Co.
Young, J. S., & Co., Ltd.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Company.
Watson-Flagg Engineering Co.
Westinghouse Electric & Mfg. Co.

Electrical Heating Devices.
Crocker-Wheeler Co.
General Electric Co.

Electric Driven Pumps.
Dean Bros. Steam Pump Works.
General Electric Co.

Electric Fans.
American Blower Co.
Crocker-Wheeler Co.
General Electric Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Watson-Flagg Engineering Co.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Crocker-Wheeler Co.
General Electric Co.

Electric Lighting.
American Blower Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
——See Motors (Electric).

Electrolyzer.
National Laundry Machinery Co.

Elevators.
Salem Elevator Works.

Embossing Machines.
Cameron Machine Co.

Employees' Time Recorders.
Pettes & Randall Co.

Engines.
——See Steam Engines.

Engine Repairs.
Fishkill Landing Machine Co.

Exhaust Heads.
Sturtevant, B. F., Co.
Power Specialty Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Scaife, W. B., & Sons.

Feed Water Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.

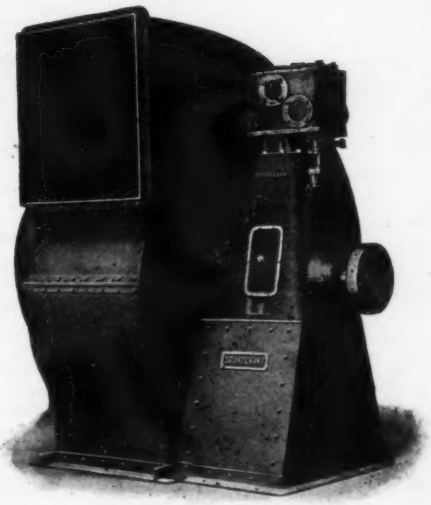
Feed Water Purifiers.
Dodge Mfg. Co.
Scaife, W. B., & Sons.

Feeds.
——See Automatic Feeds.

Feed Water Regulators.
Berry Engineering Co.

Alphabetical Advertising Index, with page numbers, follows this list.

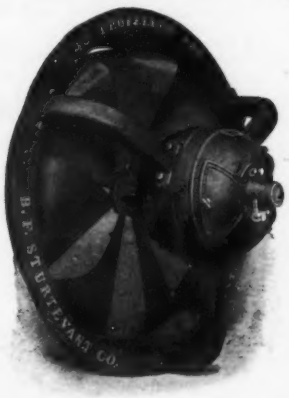
When It Is Hot



and it seems impossible to get a breath of fresh or pure air

Remember

that overheated air can be removed at slight expense by an electric fan. A propeller fan will do if the volume is large and resistance slight. For piping use a cased fan. The fan can be placed where wanted with regulating rheostat in a convenient location. A full line of electric fans is made by



B. F. STURTEVANT CO.

BOSTON, MASS.

General Office and Works, Hyde Park, Mass.

NEW YORK PHILADELPHIA CHICAGO CINCINNATI LONDON

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fan Blowers and Exhausters, Rotary Blowers and Exhausters; Steam Engines, Electric Motors and Steam Turbines; Pneumatic Separators, Fuel Economizers, Forges, Exhaust Heads, Steam Traps, etc. 718

Felt Hardeners.
Farrel Foundry and Machine Co.

Felting Machinery.
Farrel Foundry and Machine Co.

Fender Boards.
Case Bros.

Filters.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.

Fire Extinguishers.
Badger, E. B., & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.
Haskell-Dawes Machine Co.

Fluted Rolls.
Bates & Robinson Machine Co.
Hood, R. H., Company.
Leigh, Evan A.
Jefferson, Edward & Brother.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Calder Machine Works.
Hall, F. A. & P.
Hopkins Machine Works.
Jefferson, Edward, & Brother.
Leigh, Evan A.
Textile Machinery Co.

Fly Wheels.
Dodge Mfg. Co.

Forges.
Sturtevant, B. F., Co.

Friction Chains.
Oneida Community, Ltd.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans Friction Cone Co.

Fuel.
Darrow Mann Co.

Fuel Economizers.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Buhlmann, A. W.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Rodney Hunt Mach. Co.

Furnaces (Automatic Smokeless).
Murphy Iron Works.

Garnetts.
Bates & Robinson Machine Co.
Hunter, James, Machine Co.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
American Blower Co.
Sturtevant, B. F., Co.

Gaskets (Superheated Steam).
Power Specialty Co.

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Walworth Manufacturing Co.

Gears.
Dodge Mfg. Co.
Farrel Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrel Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Sturtevant, B. F., Co.

Geyser Water Heater.
Sargent's Sons, C. G., Corp.

Greases.
N. Y. & N. J. Lubricant Co.

Harness Twine.
Moore, C., & Co.

Harness and Frames.
Steel Heddle Mfg. Co.
Garland Mfg. Co.

Heating.
—See Ventilating Apparatus.

Heddles.
Howard Bros. Mfg. Co.
Richards, Atkinson & Haserick.
Steel Heddle Mfg. Co.

Hoisting Apparatus.
Economy Engineering Co.

Hose.
Boston Belting Co.

Hosiery Boards.
Pearson, J. T.
Philadelphia Drying Machinery Co.

Hosiery Labels.
Kaumagraph Company.
Kimball, A., Co.

Humidifying Apparatus.
American Moistening Co.
Bell Pure Air & Cooling Co.
Carrier Air Conditioning Co. of America.
Cramer, Stuart W.
Fries, John W.
Parks, G. M., Co.

Hydraulic Rams.
Power Specialty Co.
Walworth Mfg. Co.

Hydro Extractors.
American Laundry Mchy. Mfg. Co.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Dienelt & Eisenhardt, Inc.
Riley, C. E., Company.
Richards, Atkinson & Haserick.
Schaum & Uhlinger.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Ice Machines.
Remington Machine Co.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance (Casualty, Fire and for Loss of Profits).
Home Insurance Co.

Ironing Machines for Knit Goods.
American Laundry Machinery Mfg. Co.

Iron Glue.
Ament, H. B.

Jacquards.
Halton's, Thomas, Sons.

Jacquard Cards.
Case Bros., Inc.

Knit Goods, Edgings, Trimmings, Etc.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines Crochet, Etc.
American Laundry Machinery Mfg. Co.
Hoffman, U. S.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Ainsley Knitting Machine Co.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Climax Machine Co.
Cooper, Chas.
Crane Mfg. Co.
Dubied, Edouard, & Co.
Eppiers, John, Mach. Works.
Excelsior Knitting Machine Mfg. Co.
General Machine Works.
Gormly, Robt. W., & Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Jenckes, E., Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leckie, Jas., & Son.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros. Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Sons.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, L. T., Co.
Lamb Knitting Machine Mfg. Co.
Keystone Latch Needle Co.
Mayo Knitting Machine & Needle Co.
Wardwell Needle Co.

Labels.
Kimball, A., Co.

Lace Dressing Plant.
Simms, Geo., & Sons.

Lamps, Electric.
Cooper Hewitt Electric Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Loom Pickers.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Richards, Atkinson & Haserick.
Stafford Co., The.
Whitin Machine Works.

Loopers.
Beattie Manufacturing Co.
Hepworth, John W., & Co.
Leighton Machine Co.

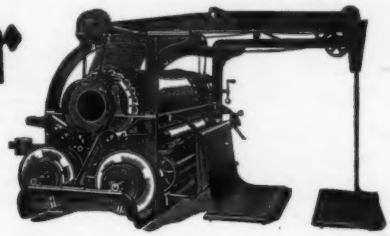
Lubricants.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
N. Y. & N. J. Lubricant Co.

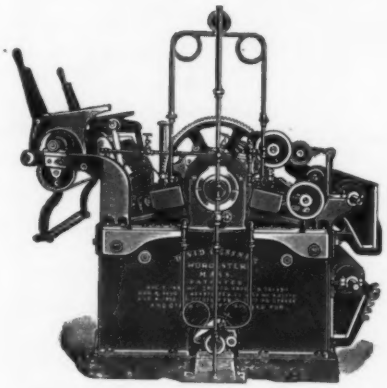
Lubricators.
Detroit Lubricator Co.
The United States Mica Co.
Walworth Mfg. Co.

Alphabetical Advertising Index, with page numbers, follows this list.

David Gessner

Worcester, Mass.

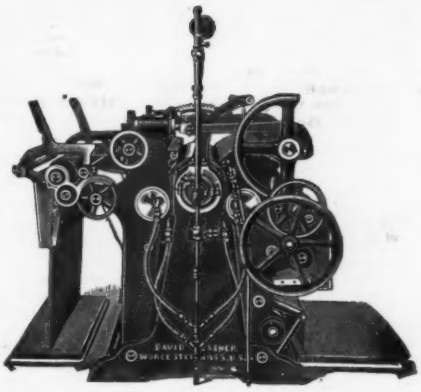




Latest Improved Cloth Finishing Machinery

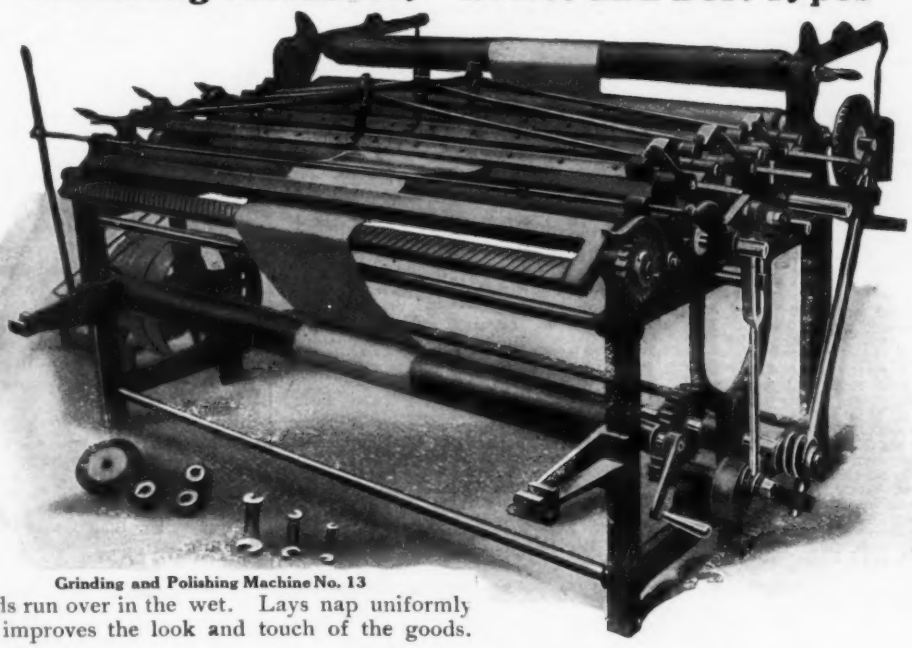
—

Napping Machines and Presses a Specialty



Schuchardt & Schutte, 90 West St., New York

Finishing Machinery—Latest and Best Types



Grinding and Polishing Machine No. 13

Goods run over in the wet. Lays nap uniformly and improves the look and touch of the goods.

Lumpers.
Gerry, George, & Son.
Schofield, Wm., Co.

Machine Designers.
Adams, A. L.
Cameron Machine Co.

Machinery Dealers.
Jefferson, Ed., & Bro.
Schofield, Geo. L.
Taylor, James.

Machinists.
Adams, A. L.
Calder Machine Works.
Cameron Machine Co.

Machinists' Tools.
Whiton, The D. E., Co.

Mails.
Walder, J.

Marking Pots.
Bradley, A. J.

Marking Tickets.
Kimball, A., Co.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliott & Hall.

Mechanical Draft.
American Blower Co.
Sirocco Engineering Co.
Sturtevant, B. F., Co.

Mechanical Draughtsmen.
Sturtevant, B. F., Co.
Cameron Machine Co.

Mechanical Engineers.
American Blower Co.
Dodge Mfg. Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mechanical Stokers.
American Ship Windlass Co.
Murphy Iron Works.

Mercerizers.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorimer, Wm. H., Sons Co.

Mercerizing Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

Metallic Packing.
Power Specialty Co.

Mill Architects.
——See Architects and Mill Engineers.

Mill Builders and Engineers.
Ferguson, John W.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Buckley's, Benjamin, Sons.
Burnham, E. E., & Co.
Crabb, Wm., & Co.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Jefferson, Ed., & Bro.
Lane, W. T., & Bro.
Leigh, Evan A.
Murphy, E. W., & Co.
N. Y. & N. J. Lubricant Co.
Philadelphia Drying Machinery Co.
Pratt, R. C.
Riley, C. E., Company.
Richards, Atkinson & Haserick.
Richardson Bros.
Schierin, Chas. A., Co.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Sweet & Doyle.
Thurston, A. G., & Son.
Vandegrift, Elias T.
Walworth Manufacturing Co.

Motors (Electric).
Crocker-Wheeler Co.
Diehl Manufacturing Co.
General Electric Co.
Sturtevant, B. F., Co.
Watson-Flagg Engineering Co.
Westinghouse Electric & Mfg. Co.

Napping Machinery.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Cocker Machinery Co.
Curtis & Marble Machine Co.
Gessner, David.
Leigh, Evan A.
Parks & Woolson Machine Co.

Noils (Silk).
Ryle, Wm., & Co.

Non-Fluid Oils.
N. Y. & N. J. Lubricant Co.

Oil Cups.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Burckhardt & Co.
Harding, Fancourt & Scull.
Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oil Stencil and Press Board Paper.
Bradley, A. J.

Overseaming Machines.
Merrow Machine Co.
Singer Sewing Machine Co.

Packings (Metallic).
Power Specialty Co.

Packings (Rubber).
Boston Belting Co.

Paints.
U. S. Gutta Percha Paint Co.

Paints (Wood Preserving).
Carbolineum Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Merwin Paper Co.
Richardson Bros.

Paper Boards.
Merwin Paper Co.

Paper and Cloth Slitters.
Cameron Machine Co.

Patent Solicitors.
Crosby & Gregory.
Foulds & Galland.
Howson & Howson.

Perforated Metals.
Harrington & King Perforating Co.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.
Oswego Machine Works.

Pipes and Fittings.
Scaife, W. B., & Sons.
Walworth Manufacturing Co.

Pneumatic Conveying.
——See Ventilating.

Portable Hoists.
Economy Engineering Co.

Power Transmission Machinery.
Almond, T. W., Mfg. Co.
American Pulley Co.
Cell Drier Machine Co.
Cresson, Geo. V., Company.
Dodge Mfg. Co.
Evans, G. Frank.
Farrel Foundry and Machine Co.
Hunter, Jas., Machine Co.
Kilburn, Lincoln & Co.
Oneida Steel Pulley Co.
Philadelphia Drying Machinery Co.
Phillips Pressed Steel Pulley Works.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William, & Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Preparatory Machinery (Cotton).
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Saco & Pettee Machine Shops.

Preservatives.
Carbolineum Wood Preserving Co.

Presses.
Automatic Machine Works.
Boomer & Boschert Press Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Hoffman, U. S., Co.
Hydraulic Press Mfg. Co.
Minnich Machine Works.
Phila. Drying Machinery Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Press Boards.
Case Bros., Inc.

Press Papers.
Merwin Paper Co.
Philadelphia Drying Mchy. Co.
Richardson Brothers (Importers and Dealers).

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Producer Gas Power Plants.
Cameron Machine Co.

Pulleys.
——See Power Transmission Machinery.

Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.
Lawrence Pump & Engine Co.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Dean Bros. Steam Pump Works.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Dodge Mfg. Co.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Quillers.
Buhlmann, A. W.
Foster Machine Co.
Payne, G. W., & Co.
Universal Winding Co.

Rag Pickers.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Raveling Machines.
American Raveler Co.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Nuttall, George.
Walder, J.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

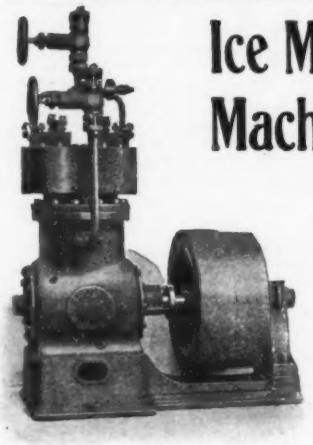
Ribbon Cutters.
Cameron Machine Co.

Ribbons.
Cheney Bros.

Ring Travelers.
Shaw, Victor, Ring Traveler Co

Roofing.
Barrett Mfg. Co.

Alphabetical Advertising Index, with page numbers, follows this list.



Ice Making Machines

of any capacity from 500 lbs. up, per day.

Send for catalogue.

Every Textile Mill can make money by installing its own Ice Making Plant: Ask Joseph Bancroft & Sons Co., Massachusetts Mills in Georgia, Erwin Cotton Mills, Duke, N. C., Belton Mills, Belton, S. C., or

REMINGTON MACHINE CO., WILMINGTON, DELAWARE.

Richards

We import a most complete and extensive line of **Cotton, Silk, Worsted and Fibre Machinery, Mill Supplies, Egyptian Cotton and Burlaps.** Representing the leading foreign manufacturers and dealers and keep thoroughly

Atkinson

up with the latest improvements in Textile Machines. We should be pleased to communicate with parties contemplating

&

any changes or additions in mill equipments and to send circulars describing at length our machines and supplies.

Haserick

152-8 CONGRESS STREET, BOSTON
8 CURRER STREET, BRADFORD, ENG.
PHILADELPHIA OFFICE, THE ARCADE

Roller Leather.
Jefferson, Edward & Brother.

Roll Coverers.
Burnham, E. E., & Co.

Rolls (Brass, etc.).
Simms, Geo., & Co.

Rolls (Rubber Covered).
Boston Belting Co.

Rope.
Dodge Mfg. Co.

Rope Dressing and Preservative.
Cling-Surface Co.

Rope Transmission.
Cresson, Geo. V., Company.
Dodge Mfg. Co.

Roving Cans.
Hill, James, Mfg. Co.
Standard Fibre Co.

Roving Reels.
Scott, Henry L., & Co.

Sash Cord Braiders.
Mason Mfg. Co.

Scallop Machines.
Merrow Machine Co.

Schools.
American School of Correspondence.
International Correspondence Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Scleroscope for Metal Testing.
Shore Instrument & Mfg. Co.

Screens (Perforated Metal).
Harrington & King Perforating Co.

Secondhand Machinery.
——See Mchry. Dealers, also classified Ads.

Separators (Yarn).
Draper Co., The.

Sewing Machines and Supplies.
American Raveler Co.
Arlington Mch. Wks. (Arthur Birch prop.)
Birch Bros., Somerville Machine Wks
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Singer Sewing Machine Co.
Textile Finishing Machinery Co.
Union Special Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Scaife, W. B., & Sons.

Shell Rolls.
Thurston, A. G., & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Buhlmann, A. W.
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Richards, Atkinson & Haserick.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

Singe Plates.
Butterworth, H. W., Sons Co.
Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Singeing Machines.
Automatic Machine Works.
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Electro-Textile Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Smith, Drum & Co.
Stubbs, Joseph.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
American Diamalt Co.
Arabol Mfg. Co.
Corn Products Refining Co.
Danker & Marston.
Miller Mfg. Co.
New Brunswick Chemical Co.
Stein, Hirsch & Co.

Skylights.
Van Noorden, E., Co.

Slashers.
Leigh, Evan A.
Lowell Machine Shop.
Riley, C. E., Company.

Soaps.
Dobbins Soap Mfg. Co.
Miller Mfg. Co.

Special Machine Designers.
Cameron Machine Co.

Spindles.
Bamford & Smith.
Bodden, Wm. & Son, Ltd.
Buckley's, Benjamin, Sons.
Calder Machine Works.
Draper Company.
Easton-Burnham Co.
Hall, F. A. & P.
Hopkins Machine Works.
Jefferson, Edward & Brother.
Leigh, Evan A.
Riley, C. E., Company.
Richards, Atkinson & Haserick.
Vandegrift, Elias T.

Spindle Tubes.
Bamford & Smith.
Calder Machine Works.
Riley, C. E., Company.
Richards, Atkinson & Haserick.
Vandegrift, Elias T.

Spinning Frame Saddles.
Dixon Lubricating Saddle Co.

Spinning Rings.
Draper Company.
Hall, F. A. & P.

Alphabetical Advertising Index, with page numbers, follows this list.

Howard & Bullough American Machine Co.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley's, Benjamin, Sons.
Hall, F. A. & P.
Jefferson, Edward & Brother.

Spools.
—See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Draper Company.
Easton & Burnham Machine Co.
Hall, F. A. & P.
Lindsay, Hyde & Co.
Lowell Machine Shop.
Payne, George W., & Co.

Stacks.
Scaife, W. B., & Sons.

Staple Stitcher.
Chas. Beck Paper Co.

Steam Boilers.
Scaife, W. B., & Sons.

Steam Engines.
American Blower Co.
Fishkill Landing Machine Co.
Providence Engineering Works.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.

Steam Heating.
American Blower Co.

Steam Jacket Kettles.
Badger, E. B., & Sons Co.

Steam Pumps.
Dean Bros. Steam Pump Works.
Goulds Manufacturing Co., The.
Walworth Mfg. Co.

Steam Specialties.
Berry Engineering Co.
Butterworth, H. W., Sons Co.
Crosby Steam Gage & Valve Co.
Sargent's Sons, C. G., Corp.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Walworth Manufacturing Co.

Steam Traps.
American Blower Co.
Sturtevant, B. F., Co.
Walworth Mfg. Co.

Steam Turbines.
General Electric Co.

Steel Frame Construction.
Scaife, W. B., & Sons.

Steel Surfacing.
Harrington & King Perforating Co.

Stencil Machines.
Bradley, A. J.

Stokers (Automatic).
American Ship Windlass Co.

Stop Motion for Knitting Machines.
Boss Knitting Machine Works.

Stop Motion for Looms.
—See Warp Stop Motions.

Superheaters, Foster.
Power Specialty Co.

Tags.
Kimball, A., Co.

Tanks, Tubs and Vats.
Cypress Lumber Co.
Hall, Amos H., Son & Co.
Hopkins Machine Works.
Klauder-Weldon Dyeing Machine Co.
New England Tank & Tower Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Scaife, W. B., & Sons.
Stearns, A. T., Lumber Co.
Woolford, G., Tank Mfg. Co.

Tapes, Braids and Edgings.
Barton, F. C.
Beacon Narrow Fabric Co.
Bias Narrow Fabric Co.
Chapin, George W.
Friedberger-Aaron Mfg. Co.
Industrial Mills Co.
Krout & Fite Mfg. Co.
Maurer, F. W., & Sons Co.
Weimar Bros.

Telephones.
Pettes & Randall Co.

Temples.
Draper Co.

Textile Schools.
—See Schools.

Thread Guide.
Palmer, I. E., Co.

Tiering Machines.
Economy Engineering Co.

Top Cutting Machines.
Wildman Mfg. Co.

Trimming Machines.
American Raveler Co.

Trade Marks.
Foulds & Galland.

Trade Mark Stamps.
Kaumagraph Co.

Trucks.
Bailey, Frank.

Turbines.
—See Water Wheels.

Turning Points.
Dickinson, T. L.

Twine.
Moore, C., & Co.
Richardson Bros.

Twist Counters.
Scott, Henry L., & Co.

Twisting Machinery.
Jefferson, Edward & Brother.
Lowell Machine Shop.
Smith & Furbush Machine Co.

Valves.
Boston Belting Co.
Crosby Steam Gage & Valve Co.
Jolly, J. & W.
Walworth Mfg. Co.

Variable Speed Transmission.
Cell Drier Machine Co.
Reeves Pulley Co.

Ventilating Apparatus.
American Blower Co.
American Moistening Co.
Berry, A. Hun.
Carrier Air Conditioning Co. of America.
Crocker-Wheeler Co.
General Electric Co.
Parks, G. M., Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Tolhurst Machine Works.
Sargent's, C. G., Sons.
Schnitzler, Chas. H.
Sirocco Engineering Co.
Sturtevant, B. F., Co.
Walworth Mfg. Co.

Warp Beams (Steel).
Mossberg, Frank, Co.

Warpers.
Draper Company.
Entwistle, T. C., Co.
Lowell Machine Shop.

Warping and Beaming Machinery.
Altemus, J. K.
Cocker Machinery Co.
Draper Company.
Entwistle, T. C., Co.
Oswald Lever Co.
Smith & Furbush Machine Co.

Warp Stop Motions.
American Textile Appliances Co.
Draper Company.
Kip-Armstrong Co.

Washers (Cloth).
American Laundry Mchy. Mfg. Co.
Arlington Mch. Works (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Works.
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Hunt, Rodney, & Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Washing Soda.
Ford, J. B., Co.

Watchman's Clocks.
Nanz, T., Clock Co.
Pettes & Randall Co.

Water Chemists.
Scaife, W. B., & Sons Co.

Water Purifiers and Filters.
Dodge Mfg. Co.
Hungerford & Terry.
Northern Water Softening Co.
Scaife, W. B., & Sons Co.

Water Softeners.
Dodge Mfg. Co.
Ford, J. B., Co.
Hungerford & Terry.
Northern Water Softening Co.
Scaife, W. B., & Sons Co.

Water Towers.
New England Tank & Tower Co.
Tippett & Wood.

Water Wheel Governors.
Woodward Governor Co.

Water Wheel Harness.
Dodge Mfg. Co.

Water Wheels.
Jolly, J. & W.
Rodney Hunt Machine Co.
Smith, S. Morgan, Co.

Winders (Cotton, Woolen and Worsted).
Allen, A. W.
Altemus, J. K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leigh, Evan A.
Lever, Oswald, Co.
Lindsay, Hyde & Co.
Lowell Machine Shop.
Payne, Geo. W., & Co.
Universal Winding Co.

Winders (Back).
Taylor, James.

Winders (Hosiery).
Altemus, Jacob K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leighton Machine Co.
Lowell Machine Shop.
Payne, G. W., & Co.
Universal Winding Co.

Wood Preserving Paints.
Carbolineum Co.

Wood Pulleys.
Dodge Mfg. Co.
Saginaw Manufacturing Co.

Wool.
Richards, Atkinson & Haserick.
Schofield, Edwin F.

Wool Cleaning Compound.
Ford, J. B., Co.

Wool Combing Machinery.
Crompton & Knowles Loom Works.
Jefferson, Edward & Brother.
Leigh, Evan A.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Wool Oil Compound.
Burckhardt & Co.
Danker & Marston.

Wool and Waste Dusters.
Jefferson, Edward & Brother.
Leigh, Evan A.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Woolen and Worsted Machinery.
Altemus, Jacob K.
American Tool & Machine Co.
Arlington Mch. Works (Arthur Birch, prop.)
Bates & Robinson Machine Co.
Birch, Arthur, Arlington Mch. Works.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Fales, L. F.

Alphabetical Advertising Index, with page numbers, follows this list.

A. D. LITTLE
H. J. Skinner
H. S. Mork
F. A. Olmsted
R. D. Gilbert
C. F. Woods
H. P. Carruth
S. H. Ayers

ARTHUR D. LITTLE
Chemical Expert and Engineer
93 Broad St., Boston
Private Telephone Exchange, 7080 Main
CHEMICAL CONTROL OF MATERIAL AND PROCESSES
Specialists in
Chemistry of Cellulose and Fibres

L. J. Willien
R. B. Sosman
C. H. Jumper
W. M. Davis
S. G. H. Fitch
E. G. Bailey
F. E Gallagher
H. W. Gillett
A. L. Dean

F. W. DEAN
Mill Engineer and Architect
Wm. W. Crosby
Special Textile Assistant

Designer of Textile and other mills, Water Power Plants, Steam and Electric Plants.
Expert Service in Valuations and Damage Suits.

Exchange Building
53 State Street,
Boston, Mass.

Firth, William, Co.
Gessner, David.
Hood, R. H., Company.
Hunter, Jas., Machine Co.
Jefferson, Ed., & Bro.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Leigh, Evan A.
Lombard Machine Co.
Lowell Machine Shop.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Rodney Hunt Mach. Co.
Sargent's, C. G., Sons.
Schofield, Geo. L.
Schofield, William, Co.
Smith & Furbush Machine Co.
Richards, Atkinson & Haserick.
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Whittle, James H., Co.
Woonsocket Machine & Press Co.

Wool Oils.
Borne, Scrymser Co.
McKerrow, H. G., Co., Ltd.

Wool Shoddies.
Slack, Wm. H. H., & Bro.

Wool Washing, Preparing and Drying Machinery.
Hunter, Jas., Machine Co.
Jefferson, Edward, & Brother.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.
Richards, Atkinson & Haserick.
Tolhurst Machine Works.

Yarn Testers.
Buhlmann, A. W.
Scott, Henry L., & Co.

YARNS, THREADS, ETC.

Banding.
Sternberg, Fred, & Co.

Cotton Yarns.
Ballou Yarn Co.
Catlin & Co.
Chapin, Geo. W.
Charles, W. B.
Cone, T. H. S.
Crabb, Wm., & Co.
Devlin, Edward.
Eddy & Street.
Germania Dye Works.
Grant Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Jenckes Spinning Co.
Littauer, Ludwig.
Mitchell, Jas. E., & Co.
Montgomery, J. R., Co.
Monument Mills.
Orswell Mills.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.
Walker, J. Townsend.

Flax, Hemp, Jute and Ramie.
Duncan & Youngs.
Fawcett, Hughes.
Littauer, Ludwig.
Sternberg, Fred, & Co.

Gassed Yarns.
Ballou Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Littauer, Ludwig.
Lorimer, E. D.
Queensbury Mills.
Sternberg, Fred, & Co.

Glazed Yarns.
Ballou Yarn Co.
Chapin, Geo. W.
Harding, Whitman & Co.
Littauer, Ludwig.
Lorimer's, Wm. H., & Sons Co.
Orswell Mills.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.

Harness Twine.
Ballou Yarn Co.
Fawcett, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
Boyer, B. F., Co.
Cannon Mills.
Century Cotton Mills.
Chapin, George W.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Hyde.
Littauer, Ludwig.
Jenckes Spinning Co.
Maryland Wool & Cotton Exchange.
Mitchell, James E., & Co.
Monument Mills.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.

Mercerized Yarns.
Harding, Whitman & Co.
Littauer, Ludwig.
Lorimer, E. D., & Co.
Montgomery, J. R., & Co.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.

Mohair Yarns.
Harding, Whitman & Co.
Littauer, Ludwig.
Montgomery, J. R., & Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.
Jenckes Spinning Co.
Littauer, Ludwig.
Montgomery, J. R., & Co.
Queensbury Mills.
Sternberg, Fred, & Co.

Silk Yarns.
Chapin, Geo. W.
Cheney Bros.
Eddy & Street.
Ryle, Wm., & Co.
Sauquoit Silk Mfg. Co.

Woolen and Merino Yarns.
Boyer, B. F., Co.
Eaton Rapids Woolen Mills.
Eddy & Street.
Hyde, E. S.
Jenckes Spinning Co.
Littauer, Ludwig.
Salkeld, A. D., & Bro.

Woolen Yarns.
Littauer, Ludwig.
McCook, Walter.

Worsted Yarns.
Boyer, B. F., Co.
Campion, Richard.
Devlin, Edward.
Harding, Whitman & Co.
Littauer, Ludwig.
McCook, Walter.
Queensbury Mills.
Pocasset Worsted Co.
Salkeld, A. D., & Bro.

Alphabetical Advertising Index, with page numbers, follows this list.

RICE'S
GLOSS MILL WHITE

The **original** glossy and light reflecting finish for mill ceilings. Never approached for covering or hiding qualities.

OFFER—We will send one gallon of Rice's Mill White free to the owner of any mill who will pay the express thereon, and mention this publication.

Send for list of users and particulars.

U. S. GUTTA-PERCHA PAINT COMPANY,
PROVIDENCE, R. I.

Pointed Staple Label Wire Stitcher

The only perfect method of attaching brand labels to stockings, or price and size tickets to all woven and knitted fabrics.

Uses an extremely fine wire giving a neat appearance.

Makes its own staples from a spool of wire costing a fraction of a cent per thousand.

The long, fine points penetrate the finest material without injury.

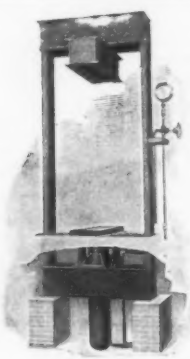
Turns the points back into the material leaving no roughness to catch or scratch.

Machines built for either foot or belt power.

Send samples of your work to be stitched, we will pay transportation both ways.

Chas. Beck Paper Co., Ltd.

609 Chestnut Street, Phila., Pa.



"FOR YOUR PRESSING NEEDS"

LONDON FINISHING CAN BE BEST AND MOST ECONOMICALLY ACCOMPLISHED ON A

HYDRAULIC PRESS

Let us tell you about our Shrinking, Drying, Hanging and Finishing Equipment.

THE HYDRAULIC PRESS MFG. CO.

New York, 3941 Cortlandt St.
Chicago, 1200 Michigan Ave.
Buffalo, 31 Church St.

46 LINCOLN AVENUE
MOUNT GILEAD, OHIO.

Alphabetical Index to Advertisements.

Acme Steel Goods Co. 63
Adams, A. L. 66
Ainslie Knitting Machine Co. .. 283
Allen, A. W. 278
Almond, T. R., Mfg. Co. 42
Altemus, Jacob K. 30
Ament, H. B. 247
American Blower Co. 287
American Diamalt Co. 265
American Finishing Machinery Co. 41
American Laundry Machinery Mfg. Co. 16
American Moistening Co. 45
American Pulley Co., The 43
American Raveler Co. 282
American School of Correspondence 235
American Ship Windlass Co. ... 54
American Supply Co. 64
American Textile Appliances Co. —
American Textile Specialty Machinery Co. 18
Am. Tool & Machine Co. 51
Arabol Mfg. Co., The 258
Arlington Machine Works 60
Ashworth Bros. 64
Atteaux, F. E., & Co. 258
Automatic Machine Works 282

Badische Company 70
Badger, E. B., & Sons Co. 60
Badger Fire Extinguisher Co. .. 60
Bailey, Frank 258
Ballou Yarn Co. 248
Bamford & Smith 52
Barrett Manufacturing Co. 242
Barton, F. C. 249
Bates & Robinson Machine Co. 59
Beattie Manufacturing Co. 284
Beck Paper Co., Chas. 228
Bell Pure Air & Cooling Co. Outside Back Cover
Berlin Aniline Works 262
Berry, A. Hun 49
Berry Engineering Co. 228
Bias Narrow Fabric Co. 249
Birch, Arthur 53
Birch Brothers 45-65
Birdsboro Steel Foundry & Machine Co. 46
Bischoff, C., & Co. 263
Blaisdell, Jr., Co., The S. 253
Bodden, Wm., & Son, Ltd. 48
Boomer & Boschert Press Co. .. 244
Borgner, Cyrus, Co. 62
Borne, Scrymser Co. 46
Boss Knitting Machine Works.. 280
Bosson & Lane 261
Boston Belting Co. 28
Boyer, B. F., Co. 250
Bradley, A. J. 247
Breedon's Son, Wm. 285
Brinton, H., & Co. 272
Broadbent, Thomas, & Sons 217
Brophy's Sons, T. 258
Brown, W. H., Co. 63
Buckley's, Benj., Son 63
Buhlmann, A. W. 68
Bull, William C. 284
Burckhardt & Co. 58
Burnham, E. E., Co. 65
Butterworth, H. W., & Sons Co. 1

Calder Machine Works 9
Cameron Machine Co. 237
Campion, Richard 250
Cannon Mills 246
Carbolineum Wood Preserving Co. 55
Carbondale Calcium Co. 263
Carrier Air Conditioning Co. of America 9
Case Brothers 62
Cassella Color Co. 261
Catlin & Co. 247
Cell Drier Machine Co. Inside Back Cover
Century Cotton Mills 248
Chaffee Bros.' Company 66
Chapin, Geo. W. 252
Charles, William B. 249-253
Cheney Bros. 252
Claes & Flentje 283
Climax Machine Co. 279
Cling Surface Mfg. Co. 218
Cocker Machinery Co. 57
Cone, T. H. S. 248
Consolidated Rendering Co. 233
Continental Latch Needle Co. .. 285
Cooper, Chas. 278
Cooper-Hewitt Electric Co. 53
Corey, Wm., Co. 285
Corn Products Refining Co. 22
Crabb, Wm., & Co. 49
Cramer, Stuart W. 12
Crane Mfg. Co. 279
Cresson, Geo. V., Co. 42
Crocker-Wheeler Co. 57
Crompton & Knowles Loom Works 36
Crosby & Gregory 231
Crosby Steam Gauge & Valve Mfg. Co. 244
Curtis & Marble Machine Co. .. 61
Cypress Lumber Co. 265

Danker & Marston 72
Darrow-Mann Co. 38
Davidson, J. F. 256
Dean Bros. Steam Pump Works 56
Dean, F. W. 227
Detroit Lubricator Co. 253
Devlin, Edward 232
Dickinson, Thos. L. 232
Diehl Mfg. Co. 65
Dienelt & Eisenhardt 62
Dinsmore Mfg. Co. 67
Dixon Lubricating Saddle Co. .. 66
Dixon, Jos., Crucible Co. 42
Dobbins Soap Mfg. Co. 44
Dodge Mfg. Co. 25
Dodge Needle Co. 285
Draper Company 3
Drouve, The G., Co. ..... —
Dubied, Edouard, & Co. 272
Duncan & Youngs 249

Easton-Burnham Co. 52
Eaton Rapids Woolen Mills 250
Economy Engineering Co. 58
Eddy & Street 246
Electro Textile Co. 51
Elliott & Hall 271
Entwistle, T. C., Co. 34-61
Epplers, John, Mach. Works 231
Eureka Fire Hose Mfg. Co. 65
Evans Friction Cone Co. 65
Excelsior Knitting Machine Mfg. Co. 276
Excelsior Needle Co. 285

Farbenfabriken of Elberfeld Co. 262
Fairbairn - Lawson-Combe-Barbour, Ltd. 36
Fales, L. F. 47
Farrell Foundry & Machine Co. 37
Fawcett, Hughes 249
Felton, S. A., & Son Co. 64
Ferguson, John W. 221
Firth & Foster Co. 257
Firth, William, Co. 44
Fishkill Landing Machine Co. .. 55
Ford, J. B., Co. 240
Foster Machine Co. Outside Back Cover
Foulds & Galland 231
Friedberger-Aaron Mfg. Co. 268
Fries, John W. 68

Gandy Belting Co. 56
Garland Mfg. Co. 244
Geisenheimer & Co. 263
General Electric Co. 19
General Mach. Works 278
Gerry, W. Geo., & Son ..... —
Gessner, David 223
Globe Dye Works Co. 256
Gormly, Robert W., & Co. 280
Goulds Mfg. Co. 286
Grant Yarn Co. 246
Graton & Knight Belting Co. 272B-C
Greene & Daniels Mfg. Co. 246
Grosser Knitting Machine Co. .. 267
Haedrich, E. M. 258
Hall, Amos H., Son & Co. 263
Hall, F. A. & P. 64
Hall, I. A., & Co. 63
Halton's, Thomas, Sons 45
Harding, Fancourt & Scull 259
Harding, Whitman & Co. 247
Harrington & King Perforating Co. 40
Hart, Chas. 284
Haskell-Dawes Machine Co. 37
Heathcote, John & Son 58
Hemphill Mfg. Co. 279
Hepworth, John W., & Co. 284
Hill, James, Mfg. Co. 61
Hoffman, U. S., Co. 273
Home Bleach & Dye Works 256
Home Insurance Co. 255
Hood, R. H., Company 62
Hopkins Machine Works ..... —
Hopkinson Dyeing & Textile Works 258
Howard & Bullough Am. Machine Co. 74
Howard Bros. Mfg. Co. 59
Howson & Howson 231
Hungerford & Terry 266
Hunt, Rodney, Machine Co. .. 47-286
Hunter, Jas., Machine Co. 15
Hyde, Edward S. 248
Hydraulic Press Mfg. Co. 228

India Alkali Works 257
Industrial Mills Co. 248
International Correspondence Schools 239
Ives, L. T., Co. 285
Jamaica Dyewood & Chemical Co. 258
Jefferson, Edw., & Bro. 62
Jenckes, E., Mfg. Co. 277
Jenckes Spinning Co. 248
Johnson, Chas. A., & Co. 257
Jolly, J. & W. 287

Kalle & Co. 262
Kaumagraph Company 29
Kenyon, D. R., & Son 47
Keystone Latch Needle Co. 285
Kilburn, Lincoln & Co. 42
Kip-Armstrong Co. 50
Kitson Machine Shop 7
Klauder-Weldon Dyeing Machine Co., The 218
Klipstein, A., & Co. 259
Krout & Fite Mfg. Co. 248

Lamb Knitting Machine Co. 283
Lane, W. T., & Bro. 46
Lawrence Pump & Engine Co. .. 47
Leckie, James, & Son 278
Leigh, Evan Arthur 13
Leighton Machine Co. 276
Lestershire Spool & Bobbin Co. 54
Lever Oswald Co. 14
Leyland, Thomas, & Co. 17
Lindsay, Hyde & Co. 285
Littauer, Ludwig 247
Little, Arthur D. 227
Lombard Machine Co. Outside Back Cover
Lorimer's, Wm. H., Sons Co. .. 256
Lowell Crayon Co. 253
Lowell Machine Shop 2
Lowell Textile School 254

Maryland Wool & Cotton Exchange 246
Mason Brush Works ..... —
Mason Machine Works 10
Mason Mfg. Co. 66
Maurer, F. W., & Sons Co. 248
Mayo Knitting Machine & Needle Co. 280
Mayo, Geo. D., Machine Co. ... 271
McCook, Walter 250
McKenna, Dr. Chas. F. 66
McKerrow, H. G., Co., Ltd. 39
Merrow Machine Co. 275
Merwin Paper Co. 246
Metallic Drawing Roll Co. 62
Metz, H. A., & Co. 260
Miller Mfg. Co. 250
Minnich Machine Works 59
Mitchell, Jas. E., Co. 247
Montgomery, J. R., Co. 248
Monument Mills 246
Moore, C., & Co. 246
Mossberg, Frank, Co. 60
Mossberg Wrench Co. 50
Murphey, E. W., & Co. 284
Murphy Iron Works 49

Nanz, T., Clock Co. 66
National Automatic Knitter Co. 282
National Laundry Machinery Co. 33
New Bedford Textile School 57
New Brunswick Chemical Co. .. 256
New England Butt Co. 266

New England Tank & Tower Co. 53
New Process Raw Hide Co. 24
New York Silk Conditioning Works 253
New York & New Jersey Lubricant Co. 254
Northern Water Softener Co. .. 56
Norwood Engineering Co. 266
Nuttall, George 231
Nye & Tredick Company 273

Oneida Community, Ltd. 26
Oneida Steel Pulley Co. 43
Orswell Mills 248
Oswego Machine Works 41

Palmer, I. E., Co. 41
Parks & Woolson Machine Co... —
Parks, G. M., Co. 27
Pawtucket Dyeing & Bleaching Co. 257
Paxton & O'Neill 281
Payne, Geo. W., Co. 282
Pearson, J. T. 274
Peerless Company, The 257
Pettes & Randall Co. 284
Philadelphia Drying Mchy. Co. 16A
Philadelphia Textile Mchy Co... 208
Philadelphia Textile School 57
Phillips Pressed Steel Pulley Works 38
Pocasset Worsted Co. 250
Power Specialty Co. 66
Pratt, Robt. G. 42
Providence Engineering Works.. 55
Providence Machine Co. 48

Queensbury Mills 250

Reeves Pulley Co. Inside Back Cover
Reliable Tie Co. 62
Remington Machine Co. 227
Rhoades, J. E., & Sons 249
Richards, Atkinson & Haserick 249
Richardson Bros. 257
Riley, C. E., Company 217
Roessler & Hasslacher Chemical Co. 260
Root, C. J., Co. 35
Rowland, Samuel 256
Ryle, William, & Co. 252

Saco & Pettee Machine Shops .. 5
Saginaw Mfg. Co. 62
Salem Elevator Works 287
Salkeld, A. D., & Bro. 247
Sargent's, C. G., Sons 32-265
Sauquoit Silk Mfg. Co. 252
Scaife, W. B., & Sons Company 265
Schaum & Uhlinger 50
Schieren, Chas. A., Co. 16B
Schnitzler, Chas. H. 253
Schofield, Edwin F. 253
Schofield, Geo. L. 232
Schofield, William, Co. 62
Schuchardt & Schutte 223
Schwartz, L. H. A., & Co. ..... —
Scott, Henry L., & Co. 31
Scott & Williams 8
Sellers, Wm., & Co. 43
Shaw, Victor, Ring Traveler Co. 64
Shore Instrument & Mfg. Co. .. 230
Shultz Belting Co. 56
Siemens & Halske 265
Simms, Geo., & Sons 60
Singer Sewing Machine Co. 272A
Sirocco Engineering Co. 287
Smith, Drum & Co. 32
Smith, S. Morgan, Co. 286
Smith & Furbush Machine Co. 288
Solway Dyeing & Textile Co. .. 258
Speed & Stephenson 33
Spence & Rideout 284
Spindler, E. O. 272-283
Stafford Co., The 4
Stafford & Holt 277
Standard Fiber Co. 54
Standard Machine Co. 281
Stearns, A. T., Lumber Co. 284
Steel Heddle Mfg. Co. 64
Stein, Hirsh & Co. 262
Stephenson Mfg. Co. 53
Sternberg, Fred, & Co. 247
Stubbs, Joseph 44
Sturtevant, B. F., Co. 221
Sweet & Doyle 63
Sykes, Walter F., & Co. 263

Taunton-New Bedford Copper Co. 63
Taylor & Fenn Co. 40
Taylor Gravity Under-Feed Stoker 54
Taylor, Jas. 275
Tebbetts, E. L., Spool Co. 64
Textile Finishing Machinery Co. Inside Front Cover
Textile Machinery Co. 63
Textile Machine Works 69-285
Thayer, Edward M., & Co. 262
Thurston, A. G., & Son 62
Tippett & Wood 53
Tolhurst Machine Works 50
Tompkins Bros. Co. 281

Union Special Machine Co. 274
U. S. Gutta-Percha Paint Co. .. 228
United States Mica Co. 61
Universal Winding Co. 11
Utica Willowvale Bleaching Co. 257

Vandegrift, Elias T. 62
Van Noorden, E., Co. 230

Walder, J. 61
Walker, J. Townsend 246
Walther, Otto 269
Walworth Manufacturing Co. Outside Back Cover
Wardwell Needle Co. 285
Waters, D. F. 54
Watson-Flagg Engineering Co... 51
Weimar Bros. 243
Western Thread & Dye Works.. 257
Westinghouse Electric & Mfg. Co. 23
Whitin Machine Works 6
Whittle, James H., Co. 59
Whitinsville Spinning Ring Co... 55
Whiton, D. E., Machine Co. 58
Wildman Mfg. Co. 270
Wilson & Co., Barnsley, Ltd. .. 48
Woodward Governor Co. 286
Woolford, G., Wood Tank Mfg. Co. 264
Woonsocket Mach. & Press Co. 20

THE SCLEROSCOPE

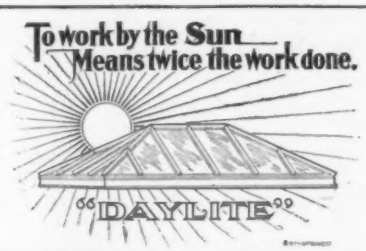
Determines the Hardness and Quality of all Metals.

This instrument shows how to order stock best suited for your work and then tells you whether the material is true to your orders.

It enables you to produce better work; work that you would no be afraid to guarantee. Booklet free

Shore Instrument & Mfg. Co.

226 West 24th St., New York.



Van Noorden Skylights

ADMIT DAYLIGHT NOTHING ELSE

Applicable wherever overhead light is desired

Send for Catalogue

E. Van Noorden Company

944 Mass. Ave., Boston, Mass.

PATENTS CROSBY & GREGORY,

JOHN C. EDWARDS NATHAN HEARD LOUIS C. SMITH

Old South Building, Washington Street, Boston.

Telephone, Main 3393, Boston. **Office Established 1854.** Cable Address, "Aniline."

Patents secured in the United States and all other countries. Reissues obtained. Interferences conducted. Suits brought and defended for infringements, and searches made as to the validity of patents. Prepared to give special and expert attention to cases involving knowledge of cotton, wool, leather and metal working machinery, including boots and shoes and electrical, chemical and mettalurgical inventions and steam engineering. We have had wide experience in textile patents cases. Correspondence solicited. No charge for preliminary advice. Personal consultation best when possible.

Counselors at Law
HOWSON & HOWSON
Solicitors of Patents

PHILADELPHIA, West End Building,
32 South Broad Street
NEW YORK, 38 Park Row
WASHINGTON, 918 F Street

A Book for Designers and Weavers.

MANUAL OF WEAVE CONSTRUCTION,

By IVO KASTANEK,

One of the Leading Authorities on this Subject in Europe.

Translated and Arranged for American Practice by Samuel S. Dale.

In this book all the foundation and derivative weaves for harness looms are systematically classified and explained.

The weaves are divided into three general classes, plain, twill and satin. Under each of these divisions are given rules for constructing derivative weaves, which are illustrated with over Five Hundred Drafts, Diagrams and Illustrations of cloth samples.

For self-instruction the workers in the mill find it of great value and as a book of reference it is equally well adapted for the practical weaver, designer and the superintendent.

There are over Five Hundred Illustrations and Diagrams, many showing the cloth with weave construction.

Over One Hundred Pages. Handsomely Bound in Green Cloth and Gold. Price, $1.00.

LORD & NAGLE COMPANY,
144 Congress St., Boston.

TRADE MARKS

Registration and Litigation

FOULDS & GALLAND

Counsellors at Law

BROAD EXCHANGE BUILDING

25 Broad Street - - New York

JOHN W. FERGUSON,
Builder and General Contractor.

MILL BUILDING A SPECIALTY. References made to some of the largest mill owners in the Middle States, including Clark Thread Co., Newark, N. J., Barbour Flax Spinning Co., Paterson, N. J., and others.

253 Broadway, N. Y. 90 Washington St., Paterson, N. J.

Elliot Cloth Folder and Measurer

FOR PRINT WORKS, GINGHAM AND COTTON, MILLS, BLEACHERIES, ETC., ETC.

Send for circular.

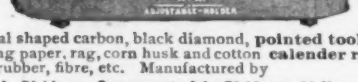
Manufactured by
ELLIOT & HALL, 54½ Hermon St., Worcester, Mass.

Geo. Nuttall,
128 East Sixth Street, CHESTER, PA.

Manufacturer of

Heddle Frames
Beamers' Raithes
and Dobby Chain

Established 1796



Special shaped carbon, black diamond, **pointed tools** for turning paper, rag, corn husk and cotton **calender rolls**, hard rubber, fibre, etc. Manufactured by

Thos. L. Dickinson, Successor to John Dickinson, 64 Nassau St. New York City.

ESTABLISHED 1885.

John Epplers Machine Works, 629 Filbert Street, Philadelphia, Penna.

Manufacturers of

LATEST IMPROVED COP MACHINERY

OF ALL KINDS AND

UPRIGHT KNITTING MACHINERY FOR MILLINERY

DRESS AND UPHOLSTERY TRIMMINGS

Wants, For Sale, Etc.

Rates 15 cents a line per issue when replies are sent in care of TEXTILE WORLD RECORD to be forwarded. If replies go direct to advertiser the rate is 10 cents per line per issue. Count seven words to a line and include side head and address. Cash must accompany the order for these ads. If such ads. are "displayed" the rate is $2.00 per inch single column each time. The publishers reserve the right to reject any advertisement.

Superintendent of Knitting Mill

Twenty-two years experience on shawls, scarfs, ladies' coats, stockings, caps, etc. Expert in fixing sewing machines. German, 36 years of age.

Address 444 Care of Textile World Record.

Wanted: Several second hand Whitin Long Chain Quilling machines, 378 ends. Give age, condition and price. Address Hope Mills Mfg. Co., Hope Mills, North Carolina.

UNION. NEW YORK

Offers free water, free lights, exemption from local taxes, good banking and shipping facilities. Industries seeking location write, Secretary Board of Trade Union, New York.

WANTED

By well known agents, the Agency for Hosiery and Knit Goods from good mill to sell from Denver west to the coast to the jobbing and large department store trade, on a commission basis:—address Caro & Upright, 717 Market St., Rooms 510 and 510½ San Francisco, Cal.

FOR SALE OR TO LET

The large four-story brick building now occupied by the Nahant Biscuit Co., at Utica, N. Y., in the heart of this TEXTILE CITY; would be well adapted for a Knitting or other Textile Mill.

For full particulars apply or write GEORGE YOUNG, 27 Rutger St., Utica, N. Y.

FOR SALE OR TO LET

Modern brick factory building, 45 x 82. Dye house wing, 34 x 24. Sprinkled throughout. 45 H. P. Harris-Corliss engine and boiler. 10 Kw. electric generator, elevator, etc. Abundance of textile help in city. Joseph C. Nowell, New Bedford, Mass.

KNITTING MACHINERY FOR SALE

5 sets D. & F. Cards, 48 x 48 Bramwell Feeds, six workers on breakers. Sleave bearings, 24in. doffers with two 16in. doffers between first and second breakers. Apperly feeds and Barker Rubbs on finisher cards. Clothing in A 1 condition.
6 Davis & Furber 300 spindle mules 2in. gauge 30 ends to drum.
4 Davis & Furber 240 spindle mules 2in. gauge 20 ends to drum.
6 40-spindle Payson winders in A 1 condition.
1 36in. D. & F. Mixing Picker.
1 40in. Clevel'd Mixing Picker.
1 36in. Sargent Burr Picker.
1 40in. Atlas Picker Feed.
3 Rag Pickers.
5 40in. Barker Rubs.
3 40x48in. D. & F. Finisher Cards, D. & F. rubs, 3 doffers.
2 48x48in. Braker Cards.
2 40x42in. Braker Cards.
1 24in. Tolhurst Extractor.
1 Sturtevant Fan & Coil 1000 ft. pipes, 2 calanders for drying in roll.
3 Campbell & Clute 3-cylinder knitting frame.
1 Tompkins knitting frame.
1 Cohoes Iron Foundry Elevator Carriage, 5x5.

GEO. E. SMITH TEXTILE MACHINE CO.
Cohoes, NEW YORK

Simplex Yarn Tables.

Showing equivalent sizes of different systems of numbering yarn; cotton, woolen, worsted, etc., so that the sizes of different standards may be quickly compared. Also contains a number of other valuable yarn tables for designers, manufacturers and knitters. PRICE 50c. Textile World Record, Boston.

WHAT DO YOU DO WITH YOUR ODD LOTS OF YARN?

Send samples and lowest cash price to

EDWARD DEVLIN, Yarn Dealer
1743 Hope Street, Philadelphia, Penna.
who buys this class of goods and pays best prices.

Harding, Fancourt & Scull,

OILS, CHEMICALS and SOAPS

Tuscan Softener, Turkey Red Oil, (all grades)
Soluble Oils and Olive Oil.

1095 Germantown Ave., PHILADELPHIA

NEW AND SECOND-HAND WOOLEN Machinery

GEO. L. SCHOFIELD, 123 No. Front St., PHILA., PA.
Agent for the Weston Hydro Extractor.

HOSIERY FINISHER OR SUPT.

Position as hosiery finisher or supt., have finished all classes of hosiery, cotton wool and worsted, seamless and full fashioned, understand finishing in all its branches. Also had experience dyeing and bleaching both wool and cotton, employed at present, good reason for leaving, good reference. Age 31 — married. Address H. F. Textile World Record.

FOR SALE

Nearly new set of frame factory buildings consisting as follows:

Good office accommodations, main building, 110′ x 60′ with ell, 90′ x 40′, 4 stories high. Carding Mill, 55′ x 37′, 2 stories high. One storage shed, 65′ x 21′, 1 story high. One storage shed, 65′ x 24′, 1 story high. Storage building, 60′ x 45′, 3 stories high with loft. Fine water power, approximately 100 to 150 Horse Power with 75 to 100 H. P. water wheel. Also fitted with new 150 H. P. boiler. 1 – 75 H. P. engine, for use in case of accidents or low water caused by drought. Also full equipment of pumps, blowers, heating system, electric light plant. Buildings also sprinkled and connected with city water.

Located in the city of Bangor, Me., a city of upwards of 30,000 population and excellent place to secure labor. Situated on the line of Bangor & Old Town Electric road, with switch and side track to plant. Just the place for woolen manufacturing. Would sell at reasonable price, or rent for term of years to responsible parties. For further information apply to

Consolidated Rendering Company

40 North Market St., Boston, Mass.

Situations Wanted.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufactu ers who may be in need of such men may address them in care of Textile World Record, Boston or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, gives special attention to this department. He would be pleased to hear from any of his friends who may be interested. Address Textile World Record, 144 Congress St., Boston, Mass.

COTTON SUPERINTENDENTS.

Superintendent or Overseering; worked on cotton hosiery, 200 needle, cashmere, woolen, these grades in all gauges, also full fashioned hosiery; familiar with all makes of machinery; will not go South or Canada; 38 years of age, married; good reference. 4380, Textile World Record, Boston, Mass.

Agent or Superintendent of a cotton mill; position wanted by a man, 40 years of age, American, married; familiar with fancy, colored and plain goods of all kinds; familiar with all kinds of cotton machinery; has been overseer for a number of years in first class mill; could take a position at short notice; good reference. 3814, Textile World

Cotton Superintendent; worked on all classes of goods from 4 to 40, also ducks and drills; familiar with Fales & Jenks, Howard & Bullough, Saco & Fettee, Lowell & Whitin makes of machinery; 30 years of age, married; good reference. 4285, Textile World Record, Boston, Mass.

Superintendent; worked on all kinds of cotton goods, grey, colored, plain, fancy and duck; will not go to Canada; 51 years of age, married; good reference. 4281, Textile World Record, Boston, Mass.

Superintendent of a cotton mill; worked on yarns from 4s to 100s; familiar with Lowell, H. & B., Whitin, Fall River, Saco and City machines; will not go anywhere but to the Southern States; 43 years of age, married; good reference. 4252, Textile World Record, Boston, Mass.

Superintendent or Agent of cotton mill; position wanted by a man 43 years of age, married, American; has worked on all kinds of cotton and worsted goods, and is familiar with Draper, Crompton & Knowles, Lowell, Whitin, Mason, Kilbourn and Lincoln looms; good references. 3669, Textile World Record,. Boston, Mass.

Manager, Superintendent, buyer or cost accountant in a cotton mill; position wanted by a man 30 years of age, American, single; has had a practical training in the manufacturing of cotton goods; good references. 3834, Textile World Record, Boston, Mass.

Superintendent of a cotton cloth mill; worked on fine and coarse, plain and fancy goods, including ginghams, corduroys khaki goods, lawns, etc. Familiar with all makes of machinery; good reference; 49 years of age, married. 4122, Textile World Record, Boston, Mass.

Superintendent or Agent of a cotton mill; worked on cotton yarns and cloths; considered an expert on either; familiar with all makes of machinery; good reference; 50 years of age, married. 4130, Textile World Record, Boston, Mass.

Superintendent of silk or cotton mill that manufactures worsted, silk plushes, terry stripes, light and heavy weight mohair pile figure upholstery plushes. Understands Jacquard and Clipper looms. Good reference. 49 years of age, married. 4668, Textile World Record, Boston, Mass.

Superintendent of a Small Mill, or assistant superintendent in a large mill; worked on fine yarns, dyed, combed and carded; print cloths, and coarse yarns; absorbent and non-absorbent cotton; familiar with all modern makes of carding and spinning machinery, also Draper looms; will not go West, South, or Canada; 33 years of age, married; good reference. 4258, Textile World Record, Boston, Mass.

WOOLEN SUPERINTENDENTS.

Superintendent of Woolen Mill. Worked on cassimeres, unions, jeans and woolens; understands all machinery and is a first class man on cards and jacks; good reference, 50 years of age, married. 4113 Textile World Record, Boston, Mass.

Superintendent or Manager of a woolen mill. Worked on cotton carded dress goods, men's suitings, worsted men's wear and worsted dress goods. Understands all makes of machinery. Will not go West, Soutn or Canada. Good reference. 30 years of age, married. 4652, Textile World Record, Boston, Mass.

Assistant Superintendent or assistant designer; worked on cotton worsteds, piece dyes, satinets, unions and cassimeres; familiar with the Johnson & Bassett mules, Knowles looms, Lombard cards and Hunter's washer and fulling mills; 23 years of age; good reference. 4271, Textile World Record, Boston, Mass.

Superintendent, Assistant or a position as boss weaver; worked on suspender, elastic and non-elastic webbing, name labels, webs, all narrow fabrics, also ginghams and lenos; familiar with Crompton & Knowles, Kilburn, Lincoln, Whitin, Draper, Mason, Schaum & Uhlinger looms; good reference; 40 years of age, married. 4129, Textile World Record, Boston, Mass.

Superintendent or Designer in a worsted or woolen mill. Worked on fine worsteds, crossbreds, piece dyes, serges, worsteds and woolen combination cloths, cross dyes, cotton worsted and wool and cotton mixes. Familiar with all makes of machinery. Good reference. 50 years of age, married. 4643, Textile World Record. Boston, Mass.

Superintendent or designer; worked on worsteds, cotton worsteds and woolens; 48 years of age, married; good reference. 4241, Textile World Record, Boston, Mass.

Superintendent or assistant superintendent; worked on plain and twill flannels, mixes, broad cloths and cloakings; familiar with Davis & Furber and Crompton & Knowles machines; 40 years of age, married; good reference. 4243, Textile World Record, Boston, Mass.

Assistant Superintendent, superintendent or designer of a woolen, yarn spinning or weaving mill; worked on suitings, fine dress goods, flannels, blankets, friezes, worsteds, etc.; familiar with Johnson & Bassett, Davis & Furber, Parks & Woolson machines; will not go West or South; 40 years of age, married; good reference. 4234, Textile World Record, Boston, Mass.

Superintendent of a Woolen, cloth or yarn mill. Might consider a good position as overseer of carding. Worked on all kinds of woolen goods, yarns made from wool, cotton and shoddy mixes. Understands all makes of carding machinery. 44 years of age, married. Good reference. 4613, Textle World Record, Boston, Mass.

Superintendent or manager of a woolen or cotton mill or overseer of weaving; worked on men's wear, ladies' dress goods, overcoatings, domet flannels, fancy shirtings, fish twines, etc.; familiar with the D. & F., Crompton & Knowles, and general woolen machinery; will not go to Canada; 55 years of age, married, American; good reference. 3457, Textile World Record, Boston, Mass.

Superintendent, boss weaver, designer, or both; worked on plain and fancy worsteds, woolen cassimeres, cheviots, overcoatings, kerseys, tourist cloth, and all kinds of ladies' dress goods; thoroughly understands and can fix all kinds of Crompton looms as well as the latest Knowles looms; will not go to Canada; 54 years of age, married; good reference. 4315, Textile World Record, Boston, Mass.

WOOLEN SUPERINTENDENTS.

Superintendent of a small yarn or weave mill, or carder or spinner in mill of 15,000 to 25,000 spindles; worked on 8 to 76 white and 3 to 36 blended yarns; familiar with Fales & Jenks, Whitin, Howard & Bullough, Lowell, S. & P., also Brooks & Dorey; will not go East or Canada; 28 years of age, American, married; good reference. 4325, Textile World Record, Boston, Mass.

Superintendent of worsted yarn spinning mill, especially top dyed yarns, French system; worked on raw stock, dyed and worsted yarns, on French and English systems, including combing; familiar with Platt Bros., Oldham, Asa Lees, Lowell Machine Shop, Fales & Jenks, Pawtucket and foreign makes of machinery; will not go West or South; 33 years of age, married, German; good reference. 4322, Textile World Record, Boston, Mass.

Superintendent of a worsted or woolen mill; 46 years of age, married, English; worked on fancy worsteds, woolens, plain and fancy, serges, piece dyes, mercerized and resist colored piece dyes, in fact all classes of men's wear; understands all makes of machinery; first class reference; could take a position at once. 4172, Textile World Record, Boston, Mass.

Superintendent of cotton waste or woolen yarn mill, or overseer of carding in large woolen mill; worked on beavers, meltons, kerseys, serges, cassimeres, homespuns, jersey cloth, box cloth, coverts, etc.; familiar with all makes of American and English cards; will not go to R. I., Conn., Vt., Pa., N. J., or South, 48 years of age, married; good reference. 1701, Textile World Record, Boston, Mass.

Assistant Superintendent and assistant designer; position wanted by a man 27 years of age, German; has worked on fancy cassimeres, overcoatings and dress goods; is familiar with Crompton & Knowles looms; good references. 3681, Textile World Record, Boston, Mass.

Superintendent; worked on fancy worsteds and woolens, plain and fancy serges, piece dyes, mercerized and resist colored piece dyes, in fact all classes of men's wear; familiar with all kinds of machinery used in the weaving of the above goods; will not go to New Hampshire, Vermont, Pennsylvania, New York, New Jersey, West, South or Canada: 46 years of age, married, English; can speak German fluently; good reference. 4172, Textile World Record, Boston, Mass.

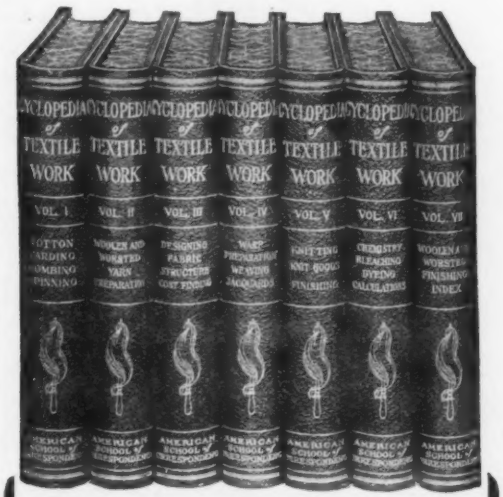
Superintendent, assistant superintendent or boss weaver in a large mill; worked on fine fancy worsteds, both men's and women's wear, fancy woolens, dress goods, kerseys, broadcloths, satinets, cotton worsteds and flannels; familiar with all makes of machinery; will not go West, South or Canada; 34 years of age, married; good reference. 4365, Textile World Record, Boston, Mass.

Superintendent or assistant superintendent of a worsted yarn mill; familiar with Prince, Smith, Lowell Machine Co., Davis & Furber cards; Draper and Whitin looms; familiar with dress goods; 26 years of age, American; good reference. 4345, Textile World Record, Boston, Mass.

Superintendent or Manager of woolen mill; position wanted by a man 47 years of age, married, Scotch; is experienced on worsteds, fancy cassimeres, homespuns, meltons, thibets, kerseys, overcoatings, cheviots and dress goods; is familiar with all kinds of woolen machinery; good references 3619, Textile World Record, Boston, Mass.

Worsted Superintendent or overseer of combing, spinning and twisting; worked on mohair, alpaca, all foreign and domestic wools; familiar with all kinds of machinery; first class references; age 45, married. 3248, Textile World Record, Boston, Mass.

Superintendent or Designer in a Woolen Mill. Worked on all classes of worsted goods. Familiar with all makes of machinery. Good reference. 50 years of age, married. 4673, Textile World Record, Boston, Mass.



LEARN TO BE BOSS

YOU CAN LEARN TO BE BOSS - you CAN get the necessary training by devoting a small portion of your spare time each day to careful study of the most interesting, practical treatise published on the textile industry:

Cyclopedia of Textile Work

The seven volumes are handsomely bound in half morocco leather and contain 2,656 pages. Size 7x10 inches. Realizing that the text alone would be of little value to the practical textile worker we have included in this work over 2000 diagrams, designs, drawings, tables, formulas etc., illustrating every section of the books.

FREE FOR EXAMINATION

These seven big volumes will be sent you upon receipt of the Coupon. You can examine them for five days, absolutely FREE of charge. If you are not satisfied with the books notify us and will have them returned at our expense. If, however, you keep the books, send us $2.00 and $3.00 every month until you have paid the special price of $19.80. The regular price is $42.00.

IMPORTANT SUBJECTS COVERED.

Cotton Fibre—Picking—Carding—Combing—Drawing—Spinning — Wool-Washing — Woolen Carding — Worsted Carding—Woolen Spinning—Worsted Spinning—Designs —Sateens — Velvet Jacquard and Leno Cotton — Woolen and Worsted Warp Preparation — Plain Weaving — Fancy Looms — General Loom Fixing—Spring Needle Knitting —Hosiery and Underwear Knitting Machines — Textile Chemistry — Textile Coloring — Mordants — Dyestuffs — Analysis of Fabrics — Finishing—Processes for Finishing Standard Fabrics—Machines Used.

FREE! Send your order before June 1st and we will include you FREE, for one year, as a monthly supplement, the

TECHNICAL WORLD MAGAZINE

a live up-to-the-minute, $1.50 monthly, crowded with special articles on the most recent applications of the principals covered in the Cyclopedia; splendidly illustrated with scores of special photographs.

FREE OFFER COUPON

American School of Correspondence, Chicago, U. S. A.

Please send set Cyclopedia of Textile Work for 5 days' free examination; also Technical World for 1 year. I will send $2.00 within 5 days and $2.00 a month until I have paid $19.80; otherwise I will notify you and hold the books subject to your order. Title not to pass until fully paid.

Name .....

Address .....

Occupation .....

Employer .....

(Tex. World Rec. 5-09.)

CARDERS.

Superintendent or carding and ring spinning in first class mill; worked on all kinds of sheetings, prints, heavy and light ducks, colored work, etc.; familiar with about all kinds of English and American makes of machinery; will not go to Pa., N. J., West or South; 48 years of age, married; good reference. 4387, Textile World Record, Boston, Mass.

Overseer of Cotton Carding; worked on sheetings, prints, denims, flannels, coarse and fine, colored and white; familiar with all makes of machinery; will not go West, South, Canada, or N. J.; 36 years of age, married; good reference. 4389, Textile World Record, Boston, Mass.

Overseer of Carding or spinning or both; worked on all wool, cotton shoddy and mixes for weaving or knitting; 1 run to 8 run; also hose run for shoddy card rooms; familiar with D. & F., J. & B., Ray and Smith cards; Barker or D. & F. rubs, English mules; 36 years of age, married; good reference. 4136, Textile World Record, Boston, Mass.

Overseer of Carding; worked on all kinds of wool, cotton and shoddy; familiar with all kinds of machinery, D. & F., Cleveland, Lombard, Smith & Furbush and Gaintor; will not go to Maine, Canada, West or South; 42 years of age, married; good reference. 4138, Textile World Record, Boston, Mass.

Overseer of Woolen Carding; worked on all kinds of goods made from wool, shoddy and cotton mixes; familiar with all makes of cards and Boulette condensers; prefers a position in the New England or New York States; good reference; 50 years of age, married. 4638, Textile World Record, Boston, Mass.

Overseer of Woolen or worsted carding; worked on all grades of stock; wool, shoddy and cotton mixes; familiar with all makes of carding machinery; will not go West, South, Canada or Pennsylvania; good reference; 36 years of age, married. 4124, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Worked on all kinds of woolen goods, made from wool, cotton and shoddy mixes. Familiar with all makes of woolen carding machinery. Good reference. 46 years of age, single. 4685, Textile World Record, Boston, Mass.

Overseer of Carding; worked on wool and cotton mixtures, straight wool, cotton and shoddy, and short stock; familiar with Davis & Furber, Smith & Furbush cards; will not go South or Canada; 32 years of age, married; good reference. 4294, Textile World Record, Boston, Mass.

Overseer of Carding; worked on all sizes of yarn, from 3/4 to 8 run, woolen, cotton and shoddy mixes, in fact all kinds of yarn; familiar with all makes of American cards, with the exception of the Boulette condenser; will not go to N. Y., N. J., West, South or Canada; 34 years of age, married; good reference. 4291, Textile World Record, Boston, Mass.

Overseer of Carding, picking or combing; worked on prints, fine hosiery yarns, has made rovings for yarn from Nos. 3 to 85; familiar with all makes of carding and combing machinery; will not go to Pa., N. J., West, South or Canada; 33 years of age, married; good reference. 4289, Textile World Record, Boston, Mass.

Comber Man or second hand of card room; worked on all grades of Peelers, Sea Island and Egyptians; familiar with the French, English and American makes of machinery; 26 years of age, married; good reference. 4268, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Worked on sheetings and hosiery yarns. Familiar with all makes of carding machinery. 30 years of age, married. Good reference. 4682, Textile World Record, Boston, Mass.

FINISHERS.

Overseer of Woolen Finishing or second hand; worked on broadcloths, cheviots, kerseys, thibets, venetians, worsteds, face finish goods from loom to case; familiar with all makes of finishing machinery; will not go to Pa., N. Y., N. J., West, South or Canada; 25 years of age, married; good reference.

Overseer of Woolen Finishing, or second hand; worked on all classes of woolen goods; familiar with all kinds of machinery; will not go to Me., Pa., N. Y., N. J., West, South, or Canada; 31 years of age; good reference. 4373, Textile World Record, Boston, Mass.

Overseer of Finishing; worked on cassimeres, beavers, kerseys, friezes, thibets, cheviots, meltons and suitings; familiar with Parks & Woolson, Gessnor, Greene & Hunt makes of machinery; 36 years of age, married; good reference. 4366, Textile World Record, Boston, Mass.

Overseer of Finishing; worked on all kinds of woolen and worsted goods; will not go to Canada; 48 years of age; good reference. 4376, Textile World Record, Boston, Mass.

Overseer of Woolen or worsted finishing. Worked or rain cloths, wool and worsted, unions and cotton worsteds. Familiar with all makes of finishing machinery. Good reference. 4595, Textile World Record, Boston, Mass.

Overseer of Finishing; worked on meltons, kerseys, broad cloths, chinchillas, cassimeres, dress goods, worsteds, both mix and piece goods; familiar with all American makes of machinery; will not go West, South or Canada; 42 years of age, married; good reference. 4235, Textile World Record, Boston, Mass.

Overseer of Finishing: worked on most all kinds of woolens, steam finish worsteds, cotton worsteds and piece dyes; familiar with most all kinds of machinery; 50 years of age, married; good reference. 4238, Textile World Record, Boston, Mass.

Overseer of Finishing; worked on beavers, kerseys, overcoatings, dress goods, cheviots, unfinished worsteds, carriage cloths, worsteds, cotton worsteds, cross dyes and resists; familiar with all makes of machinery; 27 years of age; good reference. 4239, Textile World Record, Boston, Mass.

Superintendent of cotton finishing works; worked on cotton dyed goods and prints, such as sheetings, sateens, drills, pocketings, suitings, linings, clay filled work and like nature; will not go to R. I., Conn., Me., Vt., Pa., N. J., West, South or Canada; 40 years of age; good reference. 4240, Textile World Record, Boston, Mass.

Overseer of Finishing in a woolen mill. Worked on broadcloths, carriage and billiard cloths, meltons, cassimeres, worsteds, thibets, etc. Familiar with all makes of machinery. 40 years of age, married. Will not go West, South or Canada. 4645, Textile World Record, Boston, Mass.

Overseer of Woolen Finishing. Position wanted by a man 40 years of age, married. Worked on woolen goods, cotton warps, cotton mixtures and a variety of woolen goods. Familiar with all kinds of machinery used in the finishing department. Good reference. 4562, Textile World Record, Boston, Mass.

Overseer of Finishing in a cotton mill, shipping clerk or boss weaver. Worked on ducks, sheetings, shirtings, tickings, denims, cottonades, ginghams, bed spreads, etc. Familiar with all makes of finishing machinery, C. & K., Lowell and Draper looms. Good reference. 30 years of age, married. 4639, Textile World Record, Boston, Mass.

Overseer of Finishing; worked on face goods, kerseys, broad cloths, cassimeres, and all kinds of woolens and worsteds; familiar with all modern finishing machinery; will not go West, South or Canada; 42 years of age, married; good reference. 4139, Textile World Record, Boston, Mass.

KNITTERS.

POSITIONS OPEN

We have several positions open for first class overseers to take charge of knitting and also fixing for hosiery mills. Also an overseer of finishing for an underwear mill. For further information write to the Registry Department, Lord & Nagle Company, 144 Congress St., Boston, Mass.

Superintendent of a knitting mill; worked on men's heavy weight ribbed goods mostly, also light weights, and women's wear; familiar with the Michael & Wildman, Nye & Tredick, Scott & Williams, and Fisher makes of machinery; also nappers and sewing machines to some extent; 39 years of age, married; good reference. 4382, Textile World Record, Boston, Mass.

Overseer of Knitting; worked on ladies' seamless hose, plain, fancy and ribbed top; familiar with the Acme, Scott & Williams, Hemphill, Banner and Standard makes of machinery; 24 years of age, married; good reference. 4368, Textile World Record, Boston, Mass.

Overseer of Knitting or Fixer; worked on high grade goods in plaited work, mercerized, silk, lisle, wool and cotton; familiar with the McMichael, Scott & Williams, and Nye & Tredick machines; will not go West, South, or Canada; prefers N. Y. State or Wis.; 31 years of age; good reference. 4371, Textile World Record, Boston, Mass.

Overseer of Knitting, or boss fixer of circular rib latch needle machines; worked on ladies' and children's ribbed underwear, union suits, ladies' heavy and light weight; familiar with any make of circular rib latch needle machines, sewing machines, Singer, Merrow, Union Special, Wheeler Wm., etc.; will not go to Me., N. H., Vt., West, South or Canada; 23 years of age, married; good reference. 4370, Textile World Record, Boston, Mass.

Overseer of Knitting or knitting machine fixer, underwear only; worked on ladies' knit underwear, all kinds; familiar with the Nye & Tredick, Wildman, Ruth, Champion, Scott & Williams makes of machinery; will not go West, South or Canada; good reference; 23 years of age, single. 4267, Textile World Record, Boston, Mass.

Overseer of Knitting; 38 years of age; energetic and progressive; wants position on spring needle knitting machines; 22 years' experience on stockinets, elderdowns, jerseys, astrachans, fleeces, bathing suits, athletic garments, underwear etc.; superior on these lines; good reference; married. 4087, Textile World Record, Boston, Mass.

Assistant Superintendent or overseer of knitting in a hosiery mill. Worked on hosiery made from wool, shoddy and cotton mixes from 64 to 140 needle work. Familiar with Branson, Geo. D. Mayo, Hepworth loopers and Branson ribbers. 30 years of age, married. Good reference. 4631, Textile World Record, Boston, Mass.

Superintendent of Hosiery Mill; understands knitting and finishing all grades cotton seamless hosiery; familiar with Standard knitters, also ribbers, loopers, etc.; have had over 25 years of experience; excellent handler of help; good reference; at present employed; 50 years of age, married. 4140, Textile World Record, Boston, Mass.

DESIGNERS.

Designer or Assistant; worked on worsted goods, rain cloths, ladies' dress goods, men's suitings, etc.; will not go to Pa., N. J., West, South or Canada; 23 years of age; good reference. 4377, Textile World Record, Boston, Mass.

Assistant Designer; worked on cotton and woolen goods; has a practical knowledge of what a loom can do; 40 years of age, married; good reference. 4278, Textile World Record, Boston, Mass.

Designer on all Classes of Worsted Dress Goods and men's wear. Good reference, 25 years of age, single. 4117 Textile World Record, Boston, Mass.

Designer, Designer and Asst. Supt. or supt. in a small or medium mill; worked on woolens, dress goods, suitings, overcoatings, men's wear, of all kinds, and worsteds; will not go West, or South; 40 years of age, married; good reference. 4272, Textile World Record, Boston, Mass.

Superintendent or Designer; worked on men's wear, ladies' dress goods, fancy vestings and piece dye worsteds; familiar with all makes of machinery; will go anywhere for a good position; 36 years of age, married; good reference. 4157, Textile World Record, Boston, Mass.

Designer on any class of dress goods, waistings, mantle cloths, fine shirtings, etc. 3203, Textile World Record, Boston, Mass.

Designer or assistant superintendent; worked on cotton warp flannel coverts, plain and fancy cotton warp, and all wool dress goods; first class references. 3244, Textile World Record, Boston, Mass.

Designer or superintendent; ginghams, crepe, jacquards, cycle tires, filter cloth, vesting cloth, etc.; good recommendations; middle aged man, English, married. 3169, Textile World Record, Boston, Mass.

Designer for Textile Fabrics, quilts, linens, etc.; worked on all kinds of bed spreads, linen damasks, etc.; familiar with card cutting and repeating machines, jacquard looms, etc.; 44 years of age, married; good reference. 4314, Textile World Record, Boston, Mass.

Designer or Overseer of weaving; worked on cotton worsteds, resist worsteds, and all fancy yarn dyes, worsteds, also woolens, suitings, and overcoatings; will not go West, South or Canada; 30 years of age, married; good reference. 4329, Textile World Record, Boston, Mass.

Assistant Designer, boss weaver, boss dresser, or dresser tender; worked on most everything in the line of woolens and worsteds; familiar with Knowles looms, Davis & Furber and Cleveland dressing frames; will not go West, South or Canada; 36 years of age, married; good reference. 3400, Textile World Record, Boston, Mass.

Woolen or Worsted or woolen and worsted designer. Worked on medium to high grade woolens and medium grade worsteds; familiar with Crompton, Crompton & Thayer, and Knowles looms; 38 years of age, married; good reference; will not go West, South or Canada. 4156, Textile World Record, Boston, Mass.

Cutting Machines

Every Textile Manufacturer has his own special problems. If these problems relate to cutting cloth, paper, felt, &c., in any way, shape or form we are always glad to volunteer our help in solving them.

61 Poplar Street
Brooklyn, N. Y.

Cameron Machine Co.

Special Textile
Machine Designers

SPINNERS.

Section Hand in wool, worsted or mohair spinning department; worked on mohair, wool and worsted goods; familiar with Prince, Smith & Son, and Lowell Machine Shop makes of machinery; 23 years of age; good reference. 4383, Textile World Record, Boston, Mass.

Superintendent of a worsted spinning plant, or would consider any of the branches, if satisfactory, worked on all classes of yarn from carpet to 1/2 blood; familiar with American and English makes of machinery, open and cone drawing; will not go to N. J., West, South or Canada; 43 years of age, married; good reference. 4379, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, spooling, warping or mule spinning; worked on warp and filling, hosiery and sale yarn, both coarse and fine; familiar with spinning, spooling, and warping machines, also mules; 40 years of age; good reference. 4375, Textile World Record, Boston, Mass.

Overseer of Spinning; worked on hosiery, flannels, knit goods, in fact all classes of goods; familiar with Davis & Furber and Paul mules; will not go to Me., Vt., Pa., N. J., West, South or Canada; 38 years of age, married; good reference. 4372, Textile World Record, Boston, Mass.

Overseer of Mule Spinning, spooling, warping, slashing, twisting, winding or reeling; worked on cloth and yarn, both coarse and fine counts, 8s to 100s; familiar with most all kinds of machinery; will not go West, South or Canada; 48 years of age, married. 4229, Textile World Record, Boston, Mass.

Overseer of Spinning; worked on all grades of woolens from 1 to 9 run, and woolen, shoddy and cotton mixes; familiar with Johnson & Bassett makes of machinery; will not go to Pa., South or Canada; 46 years of age, married; good reference. 4227, Textile World Record, Boston, Mass.

Overseer of Drawing and Spinning in a worsted yarn mill. Over 20 years' experience on fine, medium and coarse wools, also mohair and alpaca. Has been employed in large worsted mills in the United States. Understands all makes of machinery. Good reference. 45 years of age, married. 4656, Textile World Record, Boston, Mass.

Overseer of Spinning; worked on all wool, wool, cotton and shoddy, all shoddy on men's wear and ladies' dress goods; can handle any kind of stock that is used in a woolen mill; familiar with Davis & Furber makes of machinery; will not go to New Jersey, West, South or Canada; 42 years of age, married; good reference. 4126, Textile World Record, Boston, Mass.

Overseer of Spinning; worked on cheviots, cassimeres, outings, kerseys, thibets, venetians, coverts, cotton mixes, fancy overcoats and suitings; familiar with Davis & Furber and Johnson & Bassett mules; will not go West, South or Canada; 38 years of age, married; good reference. 4297, Textile World Record, Boston, Mass.

Overseer of Ring Spinning; worked on sheetings, shirtings, yarns for knitting and weaving, combed and carded peelers, solid colors, mixtures, dyed Egyptians and all kinds of cotton hosiery yarns, single and plies; familiar with Lowell, Saco & Pettee and Whitin machines; 27 years of age, married; good reference. 4259, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, spooling and warping. Worked on sheetings, ducks, crash, etc. Familiar with all makes of ring spinning machinery. Good reference. 50 years of age, married. 4688, Textile World Record, Boston, Mass.

Second Hand of Spinning; worked on coarse and fine yarn, also hosiery yarns; familiar with Fales, Jenks and Whitin machines; will not go West, South or Canada; 24 years of age; good reference. 4298, Textile World Record, Boston, Mass.

WEAVERS.

Overseer of Weaving or loom fixer; worked on fancy worsteds, cotton mixes, cassimeres, cheviots, fancy unions, overcoatings, dress goods, and piece dyes; familiar with Knowles fancy looms, Crompton & Knowles, 4 by 4 box and Crompton & Thayer, 4 by 4 box; will not go West, South or Canada, Pa., N. J., or Vt.; good reference; 47 years of age, married. 4378, Textile World Record, Boston, Mass.

Overseer of Weaving or loom fixer; worked on worsteds, woolens, overcoatings, and ladies' goods; prefers the Knowles looms, but can take charge of any of the latest English makes of fast running or box looms; will not go West, South, or Canada; 30 years of age, married; good reference. 4392, Textile World Record, Boston, Mass.

Overseer of Weaving; worked on fancy dress goods, plain and fancy cassimeres, plain and fancy overcoatings, cloakings and bed blankets; familiar with Davis & Furber, Crompton and Knowles looms; will not go to Pa., N. Y., N. J., West, South or Canada; 39 years of age, married; good reference. 4290, Textile World Record, Boston, Mass.

Overseer of Weaving; worked on fancy and cotton worsteds, resists, worsted and wool cassimeres, cheviots, thibets, cotton mixes, shoddy mixes, woolen yarns, etc.; familiar with Crompton and Knowles looms; will not go to N. J., West, South or Canada; 34 years of age, single; good reference. 4286, Textile World Record, Boston, Mass.

Boss Weaver and Designer, assistant designer or assistant superintendent; worked on worsted dress goods, meltons, kerseys, satinets, beavers, cotton warp goods, flannels; familiar with Crompton & Knowles, Furbush, Davis & Furber machines; will not go to Canada; 40 years of age, married; good reference. 4256, Textile World Record, Boston, Mass.

Overseer of Woolen or worsted weaving; worked on fancy woolens and worsteds; familiar with Crompton & Knowles and Crompton Thayer looms; 31 years of age, single; will not go West, South or Canada; good reference. 4142, Textile World Record, Boston, Mass.

Overseer of Weaving and designing in a woolen mill. Might accept a position as loom fixer at good wages. 34 years of age, single. Worked on men's wear, ladies' dress goods, cotton warp, blankets, etc. Familiar with the Crompton & Knowles looms. Good reference. 4583, Textile World Record, Boston, Mass.

Overseer of Weaving or dressing in a small woolen mill. Worked on wool and worsted goods. Familiar with the Knowles loom and different makes of dressing machines. 42 years of age, English, married. Good reference. 4594, Textile World Record, Boston, Mass.

Overseer of Weaving in a small mill or loom fixer. Worked on wool and worsteds. Familiar with Knowles looms. 28 years of age, single. Good reference. 4684, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving or second hand in a good mill. Worked on cassimeres, meltons, kerseys, piece dyes, plain and fancy goods. Understands Knowles looms. 26 years of age, single. Good reference. 4612, Textile World Record, Boston, Mass.

Overseer of Weaving; worked on fancy shirtings, lenos, ginghams, fancy silk ginghams, linen goods, vestings and men's and ladies' suitings, in worsted and cotton; familiar with Crompton & Knowles looms; good reference; 48 years of age, widower. 4248, Textile World Record, Boston, Mass.

Overseer of Cotton Weaving on plain and fancy cotton goods, all kinds of looms. Will not go West, South or Canada; good reference, 43 years of age, married. 4111 Textile World Record, Boston, Mass.

Overseer of Weaving in a ribbon, tape or webbing mill; a man of 15 years experience, now with a large mill; A1 mechanic, and has had a large experience on all kinds of narrow fabric looms; steady habits; good record; prefers N. E. States, but would go to N. Y. or Pa. if place was reliable; 42 years of age, married. 4283, Textile World Record, Boston, Mass.

DYERS.

Overseer of Dyeing and bleaching; worked on wool and worsted yarn, piece goods, raw cotton, knit cloth, carpet yarns, bleaching of cotton, also cotton and wool with peroxide; familiar with the Klauder & Weldon and Rodney & Hunt makes of machinery; will not go South or Canada; good reference; 37 years of age, married. 4384, Textile World Record, Boston, Mass.

Overseer of Dyeing or second hand; worked on all kinds of woolens and worsteds, piece dyes, raw stock, in fact all classes of goods, in the woolen line; familiar with most all kinds of machinery; will not go West, South, or Canada; 43 years of age, married; good reference. 4374, Textile World Record, Boston, Mass.

Overseer of Dyeing; worked on unions of all grades, broad, casket and carriage cloths, flannels, overcoatings, ladies' dress goods, etc.; prefers acid and union colors in a small mill, up to 10 sets of cards; 24 years of age; good reference. 4393, Textile World Record, Boston, Mass.

Overseer of Dyeing; worked on all kinds of woolens and worsteds; will not go West or Canada; 43 years of age, married; good reference. 4270, Textile World Record, Boston, Mass.

Overseer of Dyeing; has worked mostly on piece dyeing, especially union goods; 40 years of age, married; good reference. 4279, Textile World Record, Boston, Mass.

Overseer of Dyeing. Worked on raw stock, slubbing, yarns and piece dyes. Will not go West, South or Canada. 38 years of age, married, English. 4687, Textile World Record, Boston, Mass.

Overseer of Dyeing; worked on worsted, piece, yarn, wool and shoddy; 45 years of age, married; good reference. 4227, Textile World Record, Boston, Mass.

Second Hand in dye house. Position wanted by a young man 22 years of age. Graduate in chemistry and dyeing in textile school. Has had four years' experience in mills, two as second hand, two as overseer of dyeing. Worked on men's, ladies' worsted piece dyes, stock and worsted and cotton yarns. Good reference. 4546, Textile World Record, Boston, Mass.

Overseer of Dyeing in a woolen mill, or dyeing and finishing in a felt mill; position wanted by a man 31 years of age, married; has worked on all kinds of cotton, wool, shoddy mixes, raw stock, yarns cotton and wool, piano felts, chest protectors and hot felts; good references; could take position at once; will go anywhere. 3911, Textile World Record, Boston, Mass.

Overseer of Dyeing. Worked on dress goods, fancy cassimeres, cross dyes, hosiery, flannel, wool, cotton and shoddy, raw stock; prefers New England, 45 years of age, married, good reference. 4691 Textile World Record, Boston, Mass.

Promotion for Textile Workers

The most practical, surest, and quickest way in the world for ambitious textile workers to secure promotion is offered by an institution through whose assistance thousands of men have already advanced to better positions and larger salaries. They have done this in their own homes, in their spare time, and at an insignificant cost. We will cheerfully explain, free of charge, how we can adapt our plan to **YOUR** personal needs and income if you will write us today, stating the position you would like to secure.

INTERNATIONAL CORRESPONDENCE SCHOOLS, Box 882, Scranton, Pa.

MISCELLANEOUS.

Master Mechanic or overseer of weaving; worked on all kinds of dress goods, colored and fancy, sheetings, shirtings, etc.; familiar with all kinds of Whitin machinery, Draper, Crompton & Knowles looms, machine tools and cotton machinery; will not go West or South; 40 years of age, married; good reference. 4367, Textile World Record, Boston, Mass.

Bleachery Superintendent or assistant; worked on nearly all kinds of white goods, plain and fancy; also fancy colors and blacks in all leading finishes, as frost, chase, silesia, emboss and plain finishing; familiar with various makes of machinery; 48 years of age, married; good reference. 4388, Textile World Record, Boston, Mass.

Overseer of Dressing, spooling, slashing or twisting; worked on fancy worsteds, dress goods and piece dyes; familiar with all kinds of machinery on the market; will not go West, South, or Canada; 45 years of age, married; good reference. 4381, Textile World Record, Boston, Mass.

Loom Fixer; worked on cassimeres, meltons, kerseys and worsteds; familiar with Crompton, Knowles and Thayer looms; will not go to Pa., N. Y., N. J., West, South, or Canada; 40 years of age, married; good reference. 4386, Textile World Record, Boston, Mass.

Master Mechanic; familiar with all makes of woolen machinery; understands engines, boilers, dynamo, electric lighting, motors, water wheels, etc.; will not go to Pa., West, or South; 41 years of age, married; good reference. 4391, Textile World Record, Boston, Mass.

Overseer of Dressing, skein winding or spooling; worked on woolens, worsteds, cotton worsteds, or pure worsteds; familiar with any make of machinery; 31 years of age, married; good reference. 4369, Textile World Record, Boston, Mass.

Master Mechanic; familiar with woolen machinery; will go to the New England States only; 44 years of age, married; good reference. 4390, Textile World Record, Boston, Mass.

Master Mechanic or Chief Engineer in cotton or woolen mill. Understands all kinds of machinery, has had extensive practical experience on work that comes under a master mechanic, good manager of help, good reference, married, 43 years. 4107 Textile World Record, Boston, Mass.

Comber Man. Position wanted by a man 24 years of age; single; has worked on the Hetherington, Whitin, Nasmith, Dobson & Barlow combers. Wants a position in Massachusetts or Rhode Island only. 4085, Textile World Record, Boston, Mass.

Overseer of Seaming; position wanted by a man 27 years of age, married; has worked on ladies' cotton hose and all grades of cotton underwear; is familiar with Willcox & Gibbs, Hepworth, Campbell & Clute stitching, welting, looping, etc., machines; good references. 3683, Textile World Record, Boston, Mass.

Overseer of Burling and Sewing, or would accept a position as finisher in a fancy worsted mill; worked on fancy worsteds, woolens, cotton worsteds and dress goods of all kinds; familiar with all kinds of finishing machinery; will not go to Pa., N. Y., N. J., West, South or Canada; good reference; 35 years of age, married. 4226, Textile Weorld Record, Boston, Mass.

Overseer Worsted Combing; position wanted by a man 38 years of age, married; has worked on all classes of wools; is familiar with the Crompton & Knowles "Nobles Combs," Taylor & Wordsworth and all kinds of gill boxes; good references. 3903, Textile World Record, Boston, Mass.

Master Mechanic, engineer or machinist. Married man 36 years of age. Has worked on cotton and woolen machinery and familiar with various makes of machinery. Has had a wide experience as machinist and engineer with good reference. 4565, Textile World Record, Boston, Mass.

DOES IT PAY?

Does it pay to use the product of modern thought? That it does is evident on every hand.

Wyandotte Textile Soda

is a progressive article. To the fact that its work is an improvement on the work of other chemicals is due its success and rapidly increasing popularity.

None Genuine except with a card bearing this Trade Mark

In Every Package,

You are taking advantage of the opportunities offered in other lines, but how about your soda account? If you are not using Wyandotte Textile Soda, can you afford to allow others who are, to reap the benefit? Think it over and we believe you will see the wisdom of asking your supply house to ship you Wyandotte Textile Soda.

Further information gladly given on request.

The J. B. FORD CO., - Sole Mnfrs.

Wyandotte, Mich., U. S. A.

This Soda has been awarded the highest prize wherever exhibited.

Singer Machines for Knit Goods Manufacture

Sample of Work

Singer Machine, No. 62-36

Is a two-needle, double-thread, chain stitch machine. It is used for joining bias strips of knit goods to the straight of sateen or similar material used in the manufacture of men's drawers, giving elasticity and durability to the garment.

Singer Machine, No. 68-20

Makes an ornamental "Budding" stitch of design similar to a fern leaf, consisting of forty-eight stitches; the thread being trimmed both top and bottom, making the design complete in one operation.

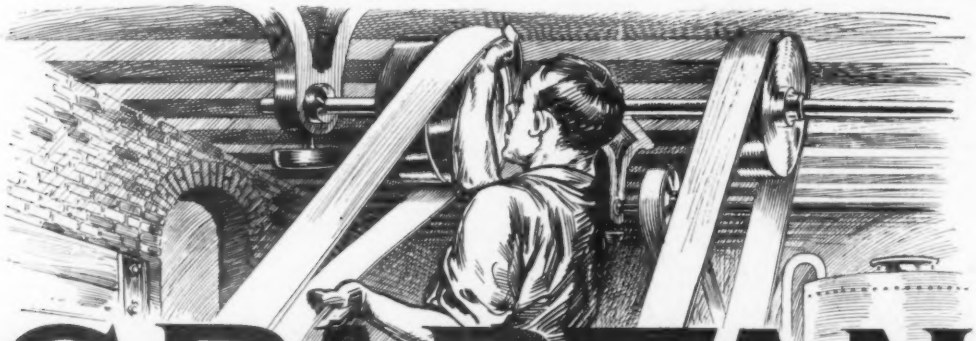
It excels for FINISHING SEAMS AND ORNAMENTING KNIT UNDERWEAR.

Sample of Work

Free samples of work furnished on application to

Singer Sewing Machine Company

Room 3613 **Singer Building, New York**



SPARTAN

Any belting which reduces the cost of power transmission is a good investment. The ordinary oak tanned belt requires time to warm up and adapt itself to the load, while the Spartan is ready for its full work when put on. That's one big difference and it's worth your while to know and prove it.

Write for

Pliability—
Means instantaneous grip, less tension, greater durability.

SPARTAN

GRATON MFG.

Worcester,

Ready for perfect work when first put on BELTING

The fact that Spartan Belting is not affected by atmospheric changes, increases its reliability, and when we tell you that it **resists steam, oils, gases and even acid vapors,** we believe you will want to know our proposition better. Our guarantee protects you in every respect and our special offer, in which we allow you to test the Spartan sixty days at our expense should interest you.

particulars

&KNIGHT CO.

Mass., U. S. A.

Pliability—
Ready *for* the work *of* the day

Do you Realize The Value Of a Perfect Marking Ticket ?

Have you stopped to consider to what extent your goods are judged by the ticket attached to them?

Many manufacturers have, and are now using

The Kimball Folding Pin-Ticket

BECAUSE

—it looks better than any other ticket.

—it is stronger—will not get torn in handling.

—it has no exposed staple ends to damage goods or scratch fingers.

—it may be removed without tearing, cutting or soiling the article marked.

—it is a labor-saver. It can be put on in less time and with less trouble than any other marking device, and

—it stays on until intentionally removed.

Samples will Prove these Claims

We also make all other kinds of tags and labels.

Tell us of your requirements and we are at your service with specimens and suggestions.

KIMBALL

A. Kimball Co.

The Ticket House

KIMBALL

307 - 309 West Broadway NEW YORK

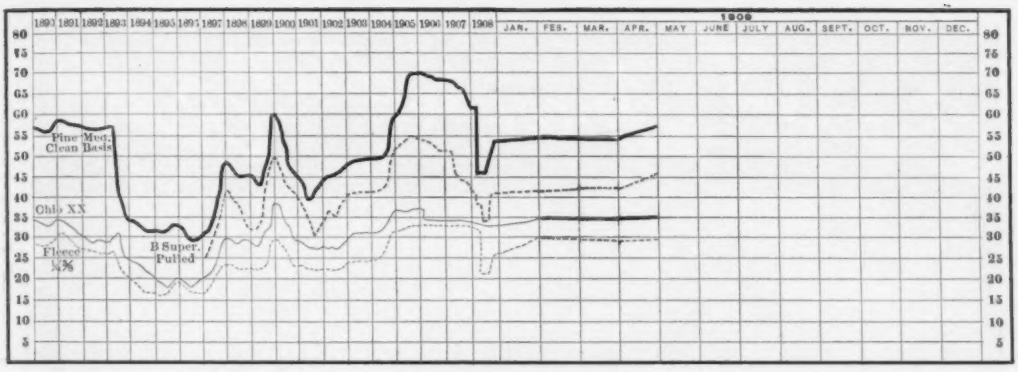


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

Business in the seaboard markets has been confined chiefly to foreign wools because domestic wools have been in very small supply. The western markets have been excited and prices have advanced rapidly and apparently without regard to shrinkage or quality. It is reported the leading manufacturers look with disfavor on the practice by Eastern wool houses of running prices up by bidding against each other for wool on the sheep's back, and have used what influence they possessed to check it. Nevertheless it has prevailed this season to an unusual extent. It is the result of the short supply of American wool, which is far below the consumption. The building of new worsted mills will make matters still worse by increasing the demand. Moreover difficulty is being encountered in finding foreign wool of sufficiently light shrinkage for importing into this country. Buyers who attended the last London sales report that prices on light shrinking lots were run up by competition between themselves to an extent never before equaled. This has been a feature of foreign wool markets for years, and is certain to become more marked as the demand for wool by American mills increases.

Personals.

Albion K. Searles, for the past six years superintendent of the Oneita Knitting Mill, Utica, N. Y., has accepted a similar position with the Paul Whitin Mfg. Company, Northbridge, Mass., succeeding Earl S. Jenckes, who has resigned.

J. O. Carr has accepted the position as overseer of the knitting department at the Oconee Knitting Mills, Walhalla, S. C. He was formerly employed at the Crescent Mills, Spartanburg, S. C.

Wm. J. Bobst, proprietor of one of the largest hosiery knitting concerns in Reading, Pa., died at his home in that city at the age of 71 years.

R. D. Maverry, overseer of weaving at the Cabarrus Mill, Concord, N. C., on the night shift, has resigned. He is succeeded by J. M. Mills.

Wm. S. Nason, overseer of finishing at the Faulkner Mfg. Company, North Billerica, Mass., has severed his connection with that company.

Frank R. Bean has accepted a position as overseer of finishing at the Faulkner Mfg. Company, North Billerica, Mass.

Wm. Easton, designer at the Globe Woolen Company, Utica, N. Y., has resigned to accept a similar position with the Puritan Mills, American Woolen Company, Plymouth, Mass.

Vernon L. Peace, overseer of weaving at the Strathmore Worsted Company, Concord Junction, Mass., has resigned to accept a similar position with the Globe Woolen Company, Utica, N. Y.

J. C. Stroud has accepted a position as overseer of spinning at the Seneca Cotton Mills, Seneca, S. C., succeeding B. F. McClure, who has been promoted to the position of superintendent.

J. T. Jenkins has been promoted to the position of overseer of weaving at the Fairfield Mills, Winnsboro, S. C.

E. F. Anderson has accepted a position as overseer of carding at the Jackson Mills, Iva, S. C., instead of G. C. Cook, as was reported.

Alex. McDougall has accepted a position as overseer of dyeing at the Gloversville Knitting Company, Gloversville, N. Y. He comes from Detroit, Mich.

Otho R. D. Hunter has accepted the position of superintendent of the Monarch Underwear Company, Bowling Green, Ohio.

Elmer W. Cobb, senior member of the firm operating the Brunswick Knitting Mills, Brunswick, Me., died after a short illness at his home in that place.

I. V. Yingst, superintendent of the True Shape Hosiery Company, formerly the Blood Mfg. Company, Philadelphia, Pa., has resigned to accept the position as assistant superintendent of the Des Moines Hosiery Mills, Des Moines, Ia.

Barrett Specification Roofs

Economical Roof Service

IN accordance with our original intention, the Barrett Specification for Pitch, Felt, and Gravel Roofs was put forward *without* naming any brands of material. We wished to make the proposition as broad as possible.

It soon became apparent, however, that many architects and engineers preferred the mention of some brand which they could *identify by label* when the goods were received at the job.

The result was that little over a year ago we placed on the market our "Barrett Specification" Brands of Pitch and Felt, which we know represent the very best quality it is possible to make. If these goods are used and the Specification followed, definite results are absolutely assured.

"Definite results" means that Barret Specification Roofs require no painting or coating. Their maintenance cost is nothing. As compared with tin and metal roofs, the first cost of a Barrett Specification Roof is much less than that of even the cheapest metal, and during a period of ten years the paint alone required to keep snch a roof tight would cost more than a new Barrett Specification Roof.

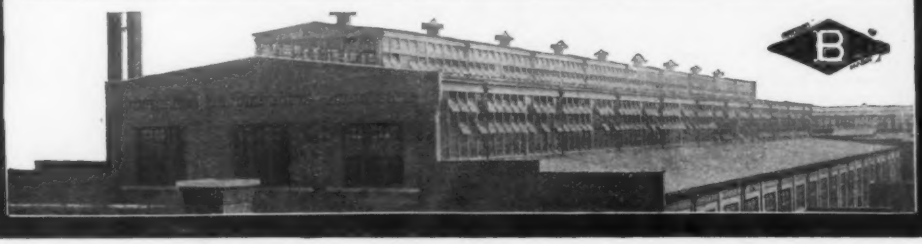
The combination of low first cost and no maintenance expense effects a total *cost-per-year-of-service* that is far below that of any other roofing—amounting as a rule to only 1/4 to 1/5 of a cent per square foot per year.

The illustrations show some of the L & N. R. R. shops which are covered with roofs laid along the lines of the Barrett Specification.

Every architect, engineer, contractor or owner of building will find it to his advantage to have the Barrett Specification on file. Mailed to anyone interested on request.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston Cleveland Minneapolis Kansas City
Pittsburg New Orleans St. Louis Cincinnati London, Eng



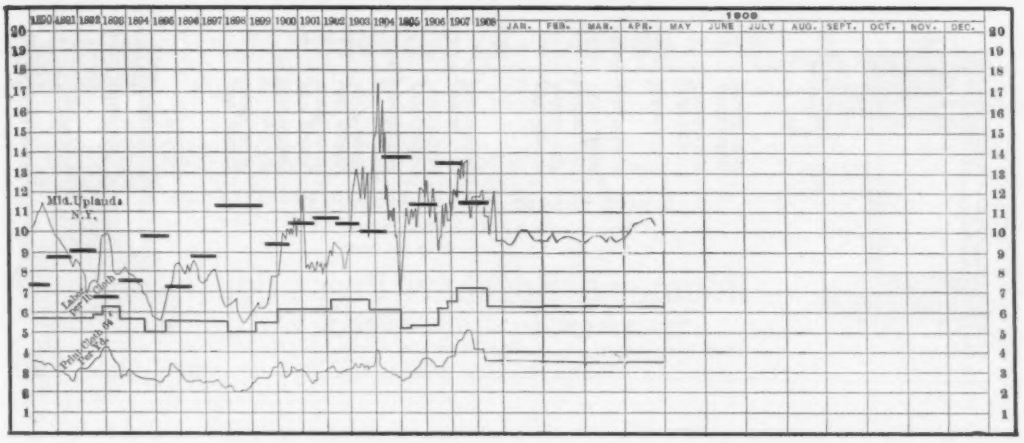


CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

The Cotton Market.

The advance in cotton during the past month was speculative, there having been no developments in the actual situation to warrant it. Reports of bad weather in the cotton belt have been freely circulated. Having served their speculative purpose they were denied. Later and more authentic information is to the effect that the weather has been favorable to the growing crop. The movement into sight from Sept. 1 to April 23, compared with previous years is given by the "Chronicle" as follows:

1908-09,	April 23	12,098,494 bales.
1907-08,	April 25	10,215,116 bales.
1906-07,	April 26	12,343,611 bales.
1905-06,	April 27	9,736,757 bales.
1904-05,	April 28	11,306,418 bales.
1903-04,	April 29	9,376,051 bales.

The world's visible supply on April 23 is estimated by the same authority at 4,624,402 bales, as compared with 4,031,198 bales on same date in 1908, 4,927,085 bales in 1907, and 4,349,886 bales in 1906.

New York, New York. The H. Wade Underwear Co. has been incorporated with capital stock of $5,000. They will manufacture underwear. Harry Wade, 64 Graham Ave., Brooklyn, N. Y., and others are the incorporators.

New York, New York City. The Crown Knitting Works, Abraham Kopolsky, proprietor, manufacturers of sweaters and other knit goods, have been removed from 104 East 4th St. to 177 Essex St.

*New York, Oriskany Falls. The Utica Knitting Co. has decided to move its main office to this place from Utica.

*New York, Richfield. The Utica Knitting Co. has agreed to purchase the Waiontha Knitting Co., provided it is sold by the receivers as a going concern. It is understood the plant will be sold as soon as possible.

North Carolina, Apex. A company will be organized with capital stock of $25,000 to build a hosiery mill. J. B. Mason, J. H. Sears, J. B. Lassiter, L. S. Olive, and others are interested.

*North Carolina, Chapel Hill. Hereafter the Blanch Hosiery Mills and the Alberta Cotton Mills will be known as Durham Hosiery Mills No. 4, and operated as a branch of the Durham Hosiery Mills of Durham, North Carolina. Warp and hosiery yarns and seamless hosiery will be manufactured. C. M. Carr and W. F. Carr of Durham attend to the buying for this concern.

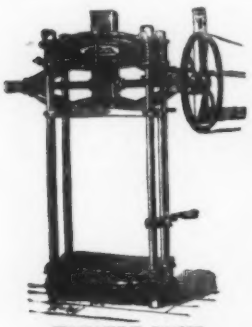
North Carolina, High Point. J. H. Tate heads a project to establish a hosiery mill at this place, and is interested in particulars of necessary equipment.

North Carolina, Middlesex. R. H. Patterson is reported interested in a plan to organize a knitting mill company.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street, PHILADELPHIA, PA.



KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

HYDRAULIC.

Good Weavers

like the "Garland" Loom Harnesses.

One reason is that the LOOPS are all filled with varnish, so that the EYES do not break back nor work loose. This makes the Harnesses weave better because there are fewer broken warp threads, which means better cloth and more of it than weaving with loose eyed Harnesses that allow the warp to get between the eye and the loop.

GARLAND MFG. CO.

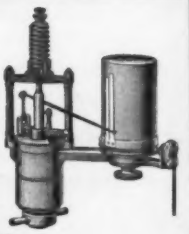
SACO, MAINE.

Formerly Loom Picker Co., Biddeford, Maine.

G TRADE MARK

A Crosby Indicator

In the Hands of a Competent Man Will Increase the efficiency of Your Plant and Cut Down Your Coal Bill. Faultless in Design. Perfect in Workmanship.



Write for Catalogue.

TRADE MARK CROSBY

Pop Safety Valves
Pressure and Vacuum Gages
Water Relief Valves
Blow-off Valves
Rubber Pump Valves

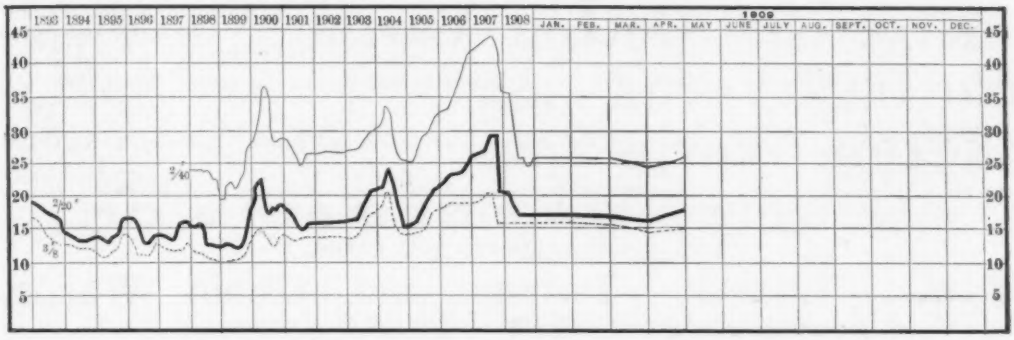
Recording Gages
Single Bell Chime Whistles
Feed Water Regulators
Lubricators—Oil Cups
Gage Glass, Water Gages, Etc.

CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

There has been a sharp advance in cotton during the past month, but the yarn market has been slow to respond to the higher price of the raw material. The stock of yarn in the hands of spinners and jobbers is still large, and this will have to be reduced before there is any decided improvement in the yarn market. An advance of 1/2 ct. to 1 1/2 cts. per pound can be secured, depending on the kind of yarn wanted, but this advance in yarn does not make matters any better for spinners than they were before the advance in cotton, except to such spinners as were fortunate enough to secure a surplus of cotton at old prices. There are signs of an improvement throughout the textile trade, and when the amount of the new crop of cotton is more definitely determined, business will probably be brought around to a more favorable basis.

Spinners at present are having trouble to get a new dollar for an old one. We quote as follows:

Eastern Cops.

6s	17½
8s	17½
10s	18
14s	19
16s	19½
18s	20
20s	20½
22s	21
24s	21½
26s	22
30s	22½
34s	23½
36s	24½
40s	25½

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12s	20
14s	20½
18s	21½
20s	22
24s	23
26s	23½
30s	24½
36s	28
40s	29
35s	33
50s	36
55s	39
60s	45

Eastern Two-Ply Warps, Carded Peeler.

2/30s	24½
2/36s	28
2/40s	29
2/45s	33
2/50s	36
2/60s	45

Egyptian Weaving Yarns.
Single Skeins Combed.

30s	36
36s	38
40s	39
45s	41
50s	46
55s	49
60s	53
70s	58

The Philadelphia Market.

7s and coarser	16½
8s and 9s	16¾
10s	17
12s	17½

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps.

DYE SULPHUR BLACKS DIRECT IN COPS, CONES OR TUBES.

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

J. TOWNSEND WALKER

The Spinners Representative

All Nos. and Descriptions of Cotton Yarn Sold Direct to the Trade

ACCOUNTS SOLICITED.

P. O. Box 659
Banigan Building, Room 528

PROVIDENCE, R. I.

Telephone Connection.

C. MOORE & CO.,

Manufacturers of

TWINES, THREADS AND YARNS

Jacquard Harness Twines of all kinds on hand and made to order.

S. W. Cor. Fifth and Market Sts., Phila.

MARYLAND WOOL AND COTTON EXCHANGE

906-908 Streeper St., Baltimore, Md.

High Grade Hosiery and Weaving Yarns all colors.

Operating Well Equipped Bleachery, Dyehouse, Spool, Cone and Twist Mill.

EDDY & STREET,

Cotton, Woolen

Yarns and Braids

Worsted, Spun Silk.

PROVIDENCE, R. I.

High Grade Hosiery Yarn

White and Colors. All Numbers. Sewing Twines on Cones and Tubes

SPECIALTIES IN WEAVING YARN

Black and White. Double and Twist for Woolen Trade.

CANNON MILLS 53-5 Worth Street, New York
Philadelphia Office, 205-7 Chestnut St.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND

FITCHBURG, MASS. **WARPS**

The Merwin Paper Company

Hartford, Conn.

Press Papers and Fender Boards

Correspondence Solicited

Mills at Rainbow, Conn. Address Inquiries to Rainbow, Conn.

14s	18
16s	18½
18s	19
20s	19½
22s	20
24s	20½
26s	21
30s	22
40s	27
50s	35

Southern high grade mule yarn:—
Cones.

10s	19
12s	19½
14s	20
16s	20¾
18s	21¼
20s and 22s	21¾-22¼
24s	22¾

Southern frame yarn, lower grades:—

6s and 8s	16
10s	16½

Eastern cones (high grade quality):

10s	20
12s	20½
14s	21
16s	21¾
18s	22¼
20s and 22s	22¾-23¼

Skein yarn (mostly Southern):—

4s and 8s soft	15½-16
10s and 12s	16-17
14s to 20s	17-17½
22s	18½
10/2	17
16/2	17½
20/2	18
30/2	21
40/2	26
8/3	16
7/6	16½
8/3 skein	15½
2/20 skein	18
2/40 skein	25

Pennsylvania, Pottsville. The Reber Knitting Mills have been incorporated with capital stock of $100,000. The new corporation takes over the business of John Reber, operating 90 latch needle knitting machines on hosiery at 14th and Market Sts. It is understood that the business will be increased.

Rhode Island, Pawtucket. A large order has been received by the Pawtucket Hosiery Co. and the concern is contemplating adding a number of new Hemphill knitting machines.

*Utah, Ephraim. It has been definitely decided by the Sanpete Knitting Works of Spring City, Utah to remove their plant to this place, and removal will be completed and manufacturing started about the middle of June. No large addition will be made to the plant during the present year; but they plan to enlarge eventually. The capital stock is $10,000. C. Hansen is president and E. Petersen is treasurer. Men's, women's and children's knit underwear is manufactured.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS
Cotton Yarns
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.
25 South Tryon Street, CHARLOTTE, N. C.

CATLIN & CO.,
Cotton Yarns.
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
128-130 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

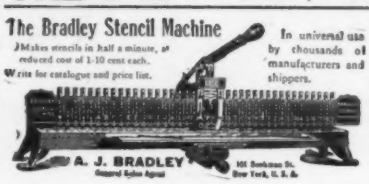
Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. Salkeld & Bro.
COMMISSION MERCHANTS
DEP'T FRED'K VIETOR & ACHELIS
Cotton and Worsted Yarns
366 Broadway cor. Franklin St., NEW YORK

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

LUDWIG LITTAUER,
SUCCESSOR TO
MOELLER & LITTAUER, 109 Greene St., New York
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey Red, Fine Gassed Yarns.
SILK MILL, BOONVILLE, N. Y.

Ament's IRON GLUE
A high grade belt glue; but suitable for all mill uses. Holds roll and pulley coverings until worn out. Write for sample demonstration.
H. B. Ament, 620 Camp Street, Louisville, Ky.

The Bradley Stencil Machine
Makes stencils in half a minute, at reduced cost of 1-10 cent each.
Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.
A. J. BRADLEY
Also manufacturers of Oil Stencil Board. Write for prices and samples.

S. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS

Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

Cotton Yarns

Jenckes Spinning Company
Pawtucket, R. I.

Carded and Combed single and twisted Yarns and Threads from Peeler, Sea Island and Egyptian Cottons, on Cops, Cones and Tubes or in Skeins and Warps. Six Cord Thread Yarns a Specialty **Bleached or in colors**

Ballou Yarn Co.
PROVIDENCE. R. I.

Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers

GASSED YARN SPECIALTIES

T. H. S. CONE, Direct Selling Agent
COTTON YARNS
77 Worth Street, New York, N. Y.
Representing
Norwood Mfg. Co., Norwood, N. C.
Linn Mills Co., Landis, N. C.

Century Cotton Mills
Manufacturers of
Hosiery Yarns
Nos. 10s to 30s Sell Direct
South Boston - - - Virginia

Knitting and Weaving YARNS.

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Authorized Capital $100,000
W. A. Dickel, Pres. and Treas.
Samuel Reid, Vice-Pres. and Sec'y.
I. B. Scovill Gen'l Mgr. and Supt.

INDUSTRIAL MILLS CO.
Jasper and Hunddingdon Sts., Phila., Pa.
Manufacturers of
NARROW FABRICS
Special Attention Paid to Plain and Fancy
Spool Tapes and Stay Bindings.

F. W. MAURER & SONS CO.
MANUFACTURERS OF
Fringes, Tapes, Bindings, & Narrow Fabrics
Office and Factory: WAYNE AVE. and BRISTOL STS.
PHILADELPHIA

KROUT & FITE MANUFACTURING CO.,
Manufacturers of
Silk, Cotton and Mercerized Narrow Fabrics
SPOOL TAPES A SPECIALTY.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

Henry M. Templeton, superintendent of the finishing department at the Wood Worsted Mills, Lawrence, Mass., it is reported will resign and accept a position in a large mill in Connecticut.

Edward Hoyle, formerly superintendent of the Moore Spinning Company, North Chelmsford, Mass., has been appointed superintendent of the new Allerton Worsted Company, which recently started operation at Lowell, Mass.

Aloys Zimmerman has accepted a position as assistant designer at the Endurance Mill, Philadelphia, Pa.

James E. Roberts has accepted a position as overseer of weaving at the American Felt Company, Glenville, Conn. He was formerly employed at Gonic, N. H.

Wm. Kenyon, overseer of machine printing at the Clyde Print Works, Riverpoint, R. I., has severed his connection with that company.

P. J. Firth has been appointed assistant superintendent of the yarn department at the Bigelow Carpet Company, Clinton, Mass.

Thomas J. Sexton, overseer of carding at the Greenville Woolen Company, Greenville, R. I., has resigned to accept a similar position with the Minterburn Mills Company, Rockville, Conn.

Geo. D. Rycker, designer at the Mayo Woolen Company, Millbury, Mass., has severed his connection with that company.

Robert Johnson has accepted a position as designer at the Mayo Woolen Company, Millbury, Mass. He comes from Pittsfield.

August Dobrow, overseer of weaving at S. Slater & Son's woolen department, Webster, Mass., has severed his connection with that company, after eleven years of continuous service. He was tendered a gift by the employes in the weave shop on his retirement.

Herbert F. Parker, overseer of carding at the Pondicherry Mills, Bridgeton, Me., has severed his connection with that company. His successor is Daniel Norton of the Forest Mills of that town. The position at the Forest Mill has been taken by Geo. F. Smith of Uxbridge, Mass.

John McArdle, employed at the Queen Dyeing Company, Providence, R. I., had his sleeve caught in the shafting. His arm was drawn over and torn from the socket.

Wm. E. Helliwell has been appointed head designer at the Washington Mills, Lawrence, Mass., succeeding J. P. Barnes, who recently resigned to take a position with the U. S. Worsted Company, of New York. Mr. Helliwell was Mr. Barnes' assistant at the Washington Mills.

LIKE THE WILLING HORSE

RHOADS LEATHER BELTING

Like the willing horse, Rhoads Belt pulls and pulls and keeps pulling, transmitting your power and turning out your product without fuss and trouble, easily doing more than its share.

J. E. Rhoads & Sons,

Philadelphia: 12 N. Third St.

New York: 40 Fulton St. Chicago: 243 E. Randolph St.
Boston: 105-111 Summer St., Hamblet & Hayes Co., Eastern Agents.

Factory and Tannery, Wilmington, Del.

LINEN YARN IMPORTER.

HUGHES FAWCETT, 115 Franklin Street, NEW YORK.

Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

DUNCAN & YOUNGS

95 Worth Street, NEW YORK

Practical Manufacturers of

YARNS, THREADS, TWINES, CORDS, ROPE

AND MILL SUPPLIES

Anything in the line you cannot get anywhere else apply to us.

William B. Charles,

Amsterdam, N. Y.

Cotton Yarns, Cotton Cloth, Silesia, Sateens,

For the Underwear Trade.

F. C. BARTON

65 Worth Street, New York

MANUFACTURERS OF

"LILY" BRAND NARROW FABRICS WEB, TAPE, BINDINGS, ETC.

THE BIAS NARROW FABRIC CO.

F. C. BARTON, President

65 Worth Street, New York

Bias and Straight Cut Fabrics and Ribbons.

Embossing and Cutting Customers Own Goods a Specialty.

Pocasset Worsted Company,

Worsted Yarns.

BOSTON
100 BOYLSTON STREET
TELEPHONE 19 OXFORD

NEW YORK
45 EAST 17TH STREET
UNION SQUARE

H. HODGSON, Pres. & Treas. FRED HODGSON, Gen. Mgr.

QUEENSBURY MILLS

Mohair, Lustre and Worsted Yarns

—Single and Two Ply—

Grey—Colors on Mixtures Worcester, Mass.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, River Ave. and Marlton St. CAMDEN, N. J.

WORSTED YARNS

RICHARD CAMPION.

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills.

300 Chestnut Street,
PHILADELPHIA, PA.

Woolen and Merino
YARNS
Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

Worsted AND Woolen **Yarns**

WALTER McCOOK

BELL TELEPHONE LOMBARD 3790 576 Bourse Philadelphia

MILLER MANUFACTURING COMPANY

Manufacturers of

SOAPS for Textile Use, SIZINGS, OILS, Etc.

Write us for Prices.

668 EDDY STREET, PROVIDENCE, R. I.

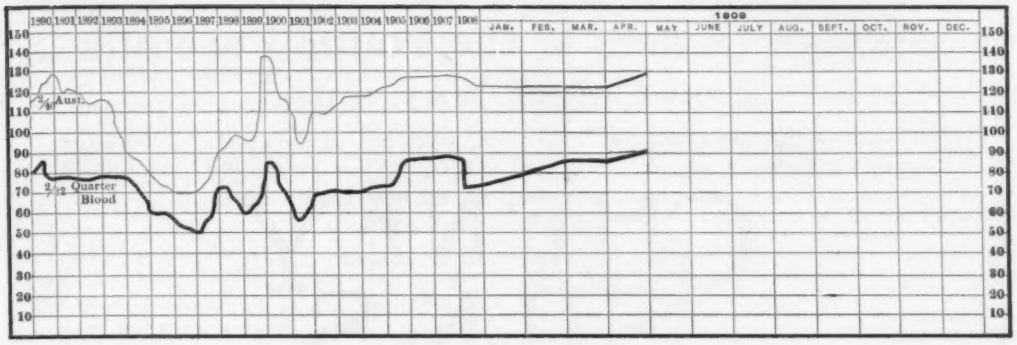


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

Woolen and Worsted Yarn Markets.

The spinners of worsted yarns, both French and Bradford systems, report that business with them at this time is better than ever before in the history of the worsted spinning business. Textile manufacturers using these yarns are all busy and crying for deliveries which, in many instances the spinners cannot make, claiming that there is not enough yarn to go around. In some cases the spinners are glad when a customer cancels an order, as they can place it with other concerns at a higher price. Many of the spinners here are entirely sold up to their fullest capacity and are making inquiries as to where they can secure outside spindles (French) to spin yarns on commission to enable them to fill orders. The scarcity of wool and the big demand for yarn has created a rising market. Manufacturers who do not place their orders today at prevailing prices, when they ask for quotations on the morrow, find that prices have risen and with no prospect that they will again be reduced to the figures which prevailed several months ago. In Bradford yarns the call is mostly for numbers ranging from 2/24s to 2/40s, while the French spinners are turning out from 2/70 to 2/36, and weft from single 22 up to 50.

Both the men's wear and dress goods manufacturers are well employed, while the knit goods manufacturers, who have already placed their contracts for yarns, are working on their productions and making shipments.

Woolen yarn spinners claim that they are getting their share of the business mostly from the knitting trade, the sweater manufacturers being the chief users and asking for whites and Oxford mixes of fine quality.

Carpet yarns are not in demand, due to the fact that manufacturers are waiting for the spring openings this month, which may stimulate business from this branch of the trade to some extent. We quote as follows:

BRADFORD SPUN YARN.

2/12 to 2/16 low common	62½-67½
2/12 to 2/20 1/4 blood	72½-75
2/20 to 2/24 1/4 blood	76-80
2/26 to 2/28 1/4 blood	80-82½
2/32 1/4 blood	87½-90
2/20 3/8 blood	92½-95
2/26 3/8 blood	97½
2/30 3/8 blood	1.00
2/36 3/8 blood	1.02½
2/40 1/2 blood	1.15
2/40 delaine	1.20
2/50 delaine	1.27½-1.30
2/40 Australian	1.30
2/50 Australian	1.37½
2/60 Australian	1.50-1.52½
2/24 lustre	85
2/28 lustre	87½
2/30 and 3/32 lustre	85-87½
2/36 lustre	95-97½
1/24 worsted and 80s single cotton for raincloths	1.00
1/24 worsted and 120 single cotton for raincloths	1.10

FRENCH SPUN YARN.

1/20 1/4 blood	80
1/20 high 1/4	82½-85
1/20 high 3/8 blood	92½-95
1/20 1/2 blood	97½-1.02½
1/20 3/8 blood	95-97½
1/30 high 1/4 blood	85-87½
1/30 3/8 blood	92½-97½
1/30 1/2 blood	1.00-1.05
1/40 1/2 blood	1.07½-1.12
1/50 delaine	1.20
1/40 Australian	1.25
1/50 Australian	1.30
1/60 Australian	1.40
1/70 Australian	1.45

Paul McDorman has been appointed chemist in charge of the Wayne Knitting Mills, Fort Wayne, Ind.

Sixteen Ounces to the Pound Pure Silk
Fast Colors Warranted

A pound of Cheney Silk *means* "sixteen ounces" of *pure silk*. That's the Cheney standard of weight. Whether it's Spun Silk Yarns or Dress Goods

CHENEY SILKS

maintain that standard. Moreover, Fast Colors are *Guaranteed*—a feature of vital importance.

CHENEY SPUN SILK YARNS

are made in the Gray or Dyed; on Spools or Cones, Warped or in the Hank. Organzines, Trams and Singles—full weight—fast colors. Special Yarns made to order for all sorts of Silks or Silk Mixture Goods. Manufacturers' orders promptly executed. Also makers of

Dress Silks, Satins, Gros-Grains, Shower-Proof Foulards, Pongees, Millinery Silks, Upholstery Goods, Ribbons, Sashes, Plushes, Velvets, etc., etc.

CHENEY BROTHERS, *Silk Manufacturers*

South Manchester, Conn.

Salesrooms:

NEW YORK, 477 Broome St. BOSTON, 79 Chauncy St.
CHICAGO, Heyworth Building PHILADELPHIA, 929 Chestnut St.
SAN FRANCISCO, Chronicle Building

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

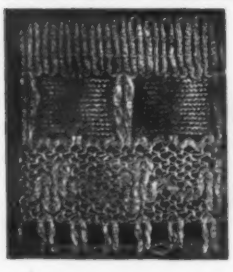
SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 188-190 Market St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 13 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones, Unbleached Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

The Rag and Shoddy Market.

There has been some improvement in the demand for wool substitutes and dealers are trying to believe that this is a result of a change in fashion from the smooth to the cheviot finish. It is certain that the clothing trade is calling for rough finished goods and that worsted manufacturers are putting that finish on worsted fabrics. The difficulty with worsteds is that they wear shiny and this is but partially remedied by finishing the goods with a rough face. In fact the trouble is often aggravated in this way because the nap raised on the worsted cloth is superficial, wears off easily and leaves a shiny surface that is more prominent because of the contrast with the surrounding dull surface.

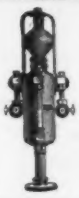
The improvement in the demand noted above is not yet sufficient to warrant the conviction that it means the restoration of the rag and shoddy trade to its old time activity, but it is distinctly encouraging. The advance in wool is also toning up the market for wool substitutes and as a result prices are distinctly firmer for both rags, shoddy and wastes.

SHODDIES AND EXTRACTS.

White yarn, best all wool	47-50
White knit, all wool, best fine	38-41
White knit, No. 2	32-38
Light yarn, extra fine	33-36
New pure indigo blue	31-32½
Merino.	
Fine light, all wool	29-31
Medium light, all wool	17-20
Fine black, all wool	27-29
Fine dark, all wool, best grade	21-23
Medium dark, all wool, No. 2	17-19
Red knit stock, strictly all wool	21-24½
Red flannel, all wool	25-27
Dark blue for hosiery, strictly all wool, No. 1	21-25
Dark blue for hosiery, not all wool, No. 2	17-20

WOOLEN RAGS.

Fine merchant tailors	10-12
Choice light colors	15-18
Browns	11-15
Blacks	10-13
Fine blues, plain	10-12
Fine dark	10-13
Medium dark	6-10
Worsteds.	
Blue	15-17
Black	19-20½
Serges.	
Black	10½-13½
Blue	11-13
Flannels.	
New scarlet	18-20
New blue	17-20
Cloakings	4½-6½



900,000
Detroit Lubricators
In service all over the world
Send for catalogue
DETROIT LUBRICATOR COMPANY.
DETROIT, U. S. A.

CHARLES H. SCHNITZLER,
Patentee and Sole Manufacturer of
THE PNEUMATIC CONVEYOR
For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.
SATISFACTION GUARANTEED Patented Oct. 15, 1889.
215 NORTH SECOND ST., - PHILADELPHIA, PA

Lowell Crayons
Meet the requirements of any cotton, woolen or worsted mill.
May we send samples? 15 colors and white.
Lowell Crayon Co., Original Manufacturers Lowell, Mass.
Trade Mark on every box.

EDWIN F. SCHOFIELD
Cotton Waste
IMPORT and EXPORT
45 S. 3rd St. Philadelphia

William B. Charles,
Amsterdam, N. Y., U. S. A.
Cotton and Wool Wastes
COTTON YARNS
Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

Testing of Yarns.
Count-Twist-Strength-Moisture-Chemical Test
When in doubt apply to
NEW YORK SILK CONDITIONING WORKS
138-140-142 Spring St., New York

SOFTS AND KNIT STOCK.

Soft woolens, best	5-7
Old white flannels	12-13
Old red flannels	12-13
Old blue flannels	5-6
Old plaids	7-10
White stockings	20-22
White hood stock	20-24
Clear hoods	10-12

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.28-2.35
Citric, domestic	38-50
Oxalic	6½-7
Sulphuric, 66°, 100 lbs.	1.00-1.10
Muriatic, 18°	1.15-1.25
Tartaric crystals	26½-27

Miscellaneous Chemicals and Dyestuffs.

Acetate of lime, gray, 100 lbs.	2.00-2.05
Alum, lump	1.75-1.90
ground	1.85-2.00
powdered	2.90-3.25
Aqua ammonia, 26°	3½-5¾
Ammoniac sal, gray	
Borax, bbls.	4½-8½
Brimstone, crude, ton	27-51
Copperas	65-80
Cream tartar, crystals	20-25
Fuller's earth, powdered, ton	21-23
Glauber's Salt	65-80
Potash, chlorate, crystals	9-10
powdered	12-13
carbonate	6-8
Soda, bicarbonate	1.60½-1.76
Soda, caustic, domestic, 60 per cent.	1.78-1.90
Sal., American	72-86
Vitriol, blue	5-6½
Acetate of soda	4-6½
Acid, picric, best crystals	25-50
tannic, commercial	30-41
Albumen, egg	60-70
blood	25-33
Alizarine, red	19
Aniline, oil	11-12½
salt crystals	14
Bichromate of potash, American	9-11
Bichromate of soda	8½-10½
Bisulphite of soda	3½-4½
Cutch, mat	5-8
Dextrine, imported potato	6-8
Divi-divi, ton	42-45

Wm. Devine, Jr., a retired Philadelphia manufacturer, and a member of the firm of Wm. Devine & Sons, died at Atlantic City, N. J., at the age of 85 years. He was a life long Republican and a member of the Philadelphia councils from the 7th ward. For many years he had been associated with his father and brother in textile manufacture.

Chas. Walker has accepted the position as overseer of dressing at the J. L. & T. D. Peck Mfg. Company, Pittsfield, Mass.

IN WILL PAY *YOU* TO TRY

TRADE MARK REGISTERED IN NON-FLUID OILS UNITED STATES PATENT OFFICE

In comb-boxes of cards

Hundreds of mills which use "A No. 00" grade **Non-Fluid Oil,** find comb-boxes run cooler and are relieved from the annoyance of oil spattering on floors, card clothing and drawing cans. This absence of waste materially reduces the amount of lubricant required and obviates mill stains and costly damage to card clothing.

Write today for free sample. A working test will convince you that **Non-Fluid Oils** will last many times as long as any oil and give you far better results. Address Dept. H.

ORIGINATORS AND SOLE MFRS.,

NEW YORK AND NEW JERSEY LUBRICANT COMPANY

165 Broadway, NEW YORK

LOWELL TEXTILE SCHOOL

Fits for the best positions in all branches of the textile industry both commercial and manufacturing.

Complete courses in Cotton Manufacture, Woolen and Worsted Manufacture, Designing, Chemistry and Dyeing and Textile Engineering. All courses include thorough training in Mechanics, Advanced Mathematics, Mechanical Drawing, Chemistry, Decorative Art, Weaving, etc.

Complete equipment for applied instruction.

For Catalogue Address

CHAS. H. EAMES, S. B., Principal,

Lowell, Mass.

FIRE, LIGHTNING, WINDSTORM.

The HOME INSURANCE COMPANY NEW YORK

Organized 1853. MAIN OFFICES, 56 CEDAR ST.

Cash Capital, $3,000,000.

ASSETS January 1, 1909	$24,856,499
LIABILITIES (Including Capital)	14,173,678
RESERVE AS A CONFLAGRATION SURPLUS	800,000
NET SURPLUS OVER ALL LIABILITIES AND RESERVES	9,882,821
SURPLUS AS REGARDS POLICY-HOLDERS	13.682,821
Losses Paid Since Organization Over	$115,000,000

IDEMNITY
For loss of
Profits
Commissions
Use & Occupancy
on acceptable
Textile Plants
at the
Minimum Rate

IS prepared to entertain liberal lines on Sprinkler-Equipped and Modern Improved risks generally, having a special department for the consideration of such business.

ELBRIDGE G. SNOW, President.

EMANNEL H. A. CORREA, Vice-Pres. AREUNAH M. BURTIS, Secretary.
FREDERICK C. BUSWELL, Vice-Pres. CHARLES L. TYNER, Secretary.
CLARENCE A. LUDLUM, Asst. Sec'y. HENRY J. FERRIS, Asst. Secretary.

Facts and Gossip.

Kentucky, Lexington. A knitting mill may be located here by B. M. McGinnis, Box 365, Kankakee, Ill.

Michigan, Ypsilanti. It is reported that the Ypsilanti Underwear Co.'s plant will shortly be started up on knit goods, and information is received that a company has been formed under the style of J. B. Colvan Co. It is probable that this new company will occupy the Ypsilanti plant.

New Jersey, Passaic. The Passaic Knitting Co. has been incorporated with capital stock of $25,000 to manufacture woolen knitted goods. Ignatz Hambor, Frank Bauer, and Christina Hambor, all of Passaic, are the incorporators. The principal office will be at 11 Monroe St., with Mr. Hambor in charge.

New York, Cohoes. Less than $5.00 damage was caused by the recent fire in the plant of the Roff Underwear Co.

*New York, Frankfort. The plan to organize a company to operate the Duofold Knitting Co.'s old plant has been dropped.

*New York, Hamilton. The Hamilton Hosiery Mills have been reorganized as reported previously, but new officers have not been elected.

*New York, Mohawk. The Augusta Knitting Mills Co. of Utica will operate the Paragon Knitting Co.'s plant, recently purchased by them as reported.

North Carolina, Tarboro. About 25 knitting machines will be added to the equipment of Wilson & Dawson Hosiery Mills, and the company contemplates building and equipping a dyeing plant.

*North Carolina, Winston-Salem. Machinery is being installed in No. 2 Mill of the P. H. Hanes Ktg. Co., and manufacturing will begin about April 30.

*Pennsylvania, Coopersburg. The loss of the Gabriel Hosiery Co. in the recent fire in their dye house was only $2,000, fully covered by insurance. The damage is being repaired.

Pennsylvania, Philadelphia. Ernest J. Aucott, manufacturer of plain and fancy hosiery at 4945-47 Wakefield St., Germantown, has increased his equipment and is now turning out 450 dozens per day.

Pennsylvania, Philadelphia. The Thomas D. Weston Company, who have been operating a plant at 3723 Filbert St., West Philadelphia, has been reorganized and removed their business to 5127 Lena St., Germantown, where they have taken over the three story mill, formerly used as a hosiery plant, and are installing 18 knitters, 12 sewing machines and 4 loopers, which they will operate on fine worsted gold gloves employing 80 hands. The motive power will be both steam and electric. The officers of the company are Thomas D. Weston, president and superintendent and W. B. MacKenney, treasurer. They will sell direct.

The WM. H. LORIMER'S SONS CO.,

Manufacturers of

MERCERIZED YARNS

FOR ALL PURPOSES.

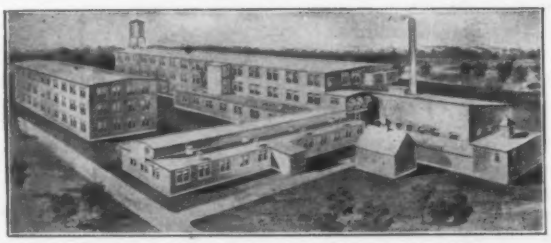
MERCERIZERS AND DYERS,

New York Office:
Room 911 New York Life Building,
346 Broadway.

Ontario and Lawrence Sts.,
PHILADELPHIA, PA.

PETER B. MCMANUS, Pres. and Treas. EDWARD J. MCCAUGHEY, Secy. and Mgr. JOHN MCMANUS, Vice-Pres.

HOME BLEACH AND DYE WORKS, Inc.



Dyers, Bleachers and Mercerizers of

Cotton Yarns

in skein, and long and short

CHAIN WARPS

Fast Colors a Specialty.

Daily Capacity 30,000 lbs.

Fast Colors and Black for Worsted Trade.

Office and Works, Pawtucket, R. I.

Established 1881.

GLOBE DYE WORKS CO.,

Successors to R. Greenwood & Bault

DYERS BLEACHERS AND **MERCERIZERS**

OF COTTON WARPS AND SKEIN YARNS

Globe Bleach and Dye Works,
Oxford and Worth Sts., Frankford, Pa.

140 Chestnut St., PHILADELPHIA.

YARNS BLEACHED AND DYED (delivered on cones)

BLEACHING and DYEING

ESPECIALLY FOR THE

KNIT GOODS TRADE

CONE WINDING FOR THE TRADE

Schuylkill Haven Bleach and Dye Works, SAMUEL ROWLAND, **Schuylkill Haven, Pa.**

N. B. Bleached Finishing Yarns on Cones for Underwear, always in Stock.

JOHN F. DAVIDSON, Orianna Bleach Works

BLEACHER

Of Turkish Towels, Cotton Yarns, Underwear and Tapes

2558-2564 North 3d Street, 2557-2563 Orianna Street, PHILADELPHIA
Office, 2557 Orianna Street, Correspondence Solicited

THE NEW BRUNSWICK CHEMICAL COMPANY

New Brunswick, N. J.

Manufacturers of Sizing and Finishing Compounds for all Kinds of Fabrics, Gums, Softeners, Soluble Oils, Etc.

Special Preparations for Mercerized, and Silk and Cotton Mixed Goods.

FIRTH & FOSTER CO.

Dyers and Finishers

York, Emerald and Adams Sts., Philadelphia, Pa.

New York Office, Silk Exchange Bldg., Cor. Broadway and Broome Sts.

Dyeing and Finishing of Piece Goods Exclusively, such as Wool Armures, Prunellas, Satins and Henriettas, Panamas, Poplins, Serges and Cheviots. Mohairs, Bradford Finish, in Fancy and Solid Colorings. Also Suitings and Cloakings.
Specialty in the Treating of Silk and Wool Fabrics, such as Eoliennes, Crepes and Henriettas and all high class wool tissues like Batiste, Voiles and Foules. Also, Cotton and Wool Goods, Mohair Linings and Lastings.

SPECIAL ATTENTION IS GIVEN TO THE REDYEING OF ABOVE

UTICA WILLOWVALE BLEACHING CO.

Sheetings, Shirtings, Lawns, India Linons.
Everything in White Goods.

John MacManus, Superintendent.

CHADWICKS, N. Y.

The Western Thread and Dye Works

COTTON AND MERCERIZED DYEING AND BLEACHING
CONE AND TUBE WINDING

21st Street and Marshall Boulevard, CHICAGO

Pawtucket Dyeing and Bleaching Co. Bleachers and Dyers of COTTON YARNS and STOCKINET

Office with Blodgett & Orswell Co., Manufacturers of Glazed Yarns.

232 Front St., Pawtucket, R. I.

THE PEERLESS COMPANY,
Willard and Jasper Sts., Philadelphia.
Dyers of Skein Silk
FOR ALL TEXTILE PURPOSES
Fast Colors on Silk for Worsted Manufacturers.
Pure Dye and Weighted. Bright and Souple.
Dyers of Peerless Black on Artificial Silk.

SAVOGRAN
Cleans Wool, Floors, Anything.
INDIA ALKALI WORKS, Boston.

Duxbury's English Calender Roll Papers
FOR EMBOSSING AND OTHER CALENDERS.
CHAS. A. JOHNSON & CO. Sole Agents for America
55-57 Franklin St., NEW YORK.

RICHARDSON BROTHERS
51 AND 53 FRANKLIN STREET, NEW YORK
PAPER AND TWINE MERCHANTS
FOR FINISHERS OF TEXTILE FABRICS
"ROYAL" PRESS PAPERS

THE SOLWAY DYEING & TEXTILE CO.,
PAWTUCKET, R. I.

Dyers, Bleachers and Mercerizers

of Cotton Yarns in Long or Short Chain Warps and Skein in FAST COLORS, for all purposes.

Also Dyers of Genuine Turkey Reds.

Dyers of all kinds of YARNS and HOSIERY

Woolen and Worsted yarns a specialty. Latest improved machinery for dyeing hosiery in Sulphur, Black, Tans and fancy colors. Better work and better service than you get elsewhere.

T. BROPHY'S SONS, Jasper St., above Clearfield St., - - PHILADELPHIA, PA.

ARABOL MANUFACTURING COMPANY,
100 William Street, New York.

Sizing, Stiffening, Softening and Finishing Compounds, Glues, Gums, Dextrines, Starches, China Clay, Bone Size and Grease, Soap, Tallow, Weighteners,

EVERYTHING IN SIZINGS, Etc. SAMPLES MATCHED. HIGH GRADE GOODS.

The Jamaica Dyewood and Chemical Co.

"RIO DE ORO" Brand Logwood Extract

Headquarters for Logwood—Crystals, Hermatine Paste
Fustic Crystals, Fustic Paste, Quebracho, Sumac

No. 50 Church Street - - - New York
Hudson Terminal Building

T. HOPKINSON, Prop'r and Mgr. G. W. HOPKINSON, Supt.

HOPKINSON DYEING & TEXTILE WORKS

Bleachers and Dyers of

Cotton Skein Yarns, Tie Bands, Twines, Braids and all Narrow Fabrics. Cone Winding or Tubing to Order

OFFICE AND WORKS

259 Forest Street, FALL RIVER, MASS.

DYE STICKS

Drying and Sulphur House Poles of Natural Round Water Grown Cedar for Cotton, Wool, etc. Special Hardwoods in Standard No. 1 and "Selects" without knots, grades, for Silk Dyeing. Manufactured by, prices and all information from

E. M. HAEDRICH,

601 Mariner and Merchant Bldg., ... Philadelphia.

Aniline Colors
Alizarine Colors
Dyestuffs
Chemicals

F. E. Atteaux & Co.

INCORPORATED

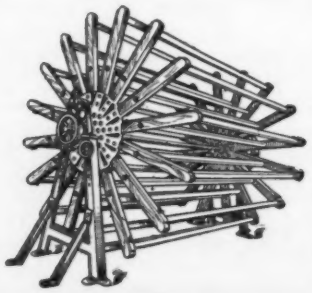
BOSTON, 176 Purchase St.

Branches:
Montreal Gloversville Chicago

Leaves yarn in beautiful condition—Bailey's Cold Air Drying System

Yarn dried by this system is much softer, winds and weaves better, shows less percentage of waste and the colors develop better. In use in over two hundred mills. Simple, effective, inexpensive. Investigate its merits for your profits sake. Where great capacity is wanted my *hot air system* is unequalled.

Dye Sticks, Dry Poles, Fans, Trucks for Yarn Dryers and Dye Houses.



FRANK BAILEY, Manufacturer, Works at Braddock.
P. O. Ad., Cedar Brook, Camden Co., N. J.

A. KLIPSTEIN & CO.

Dyestuffs and Chemicals

Fast Colors for Wool and Cotton.
Full Line of Direct Cotton Colors.

THIOPHENOL BLACK T EXTRA and 2 B EXTRA.
PYROGEN BLUE R . . .
PYROGEN INDIGO. . . . .

Direct Sulphur Colors, Faster than Indigo, to light and Washing.

Chrome Fast Blacks, Blues, Browns and Yellows.
Acid Benzyl Blue, Violet Green and Black.

Headquarters for Caustic Potash 90%. Carbonate of Potash. Chlorate of Potash and Soda. Tannic Acid. Bleaching Powder.

122 Pearl Street, .. NEW YORK

BRANCHES

Boston Providence Philadelphia Chicago Hamilton and Montreal, Canada

SOLE AGENTS FOR

The Society of Chemical Industry, Basle, Switzerland.

THIOGENE COLORS

Sulphur Colors for cotton dyeing.

MONOCHROME COLORS

Fast one-dip mordant dyes.

RESIST COLORS All shades

H. A. Metz & Co.,

122 Hudson Street, NEW YORK, N. Y.

Boston, Mass.
Philadelphia, Pa.
Providence, R. I.
Charlotte, N. C.
Atlanta, Ga.
Chicago, Ill.
San Francisco, Cal.
Montreal, Canada
Toronto, Canada
Hamburg, Germany

Laboratories: NEWARK, N. J.

Advice on

PEROXIDE BLEACHING

free to mills

The Roessler & Hasslacher Chemical Co.

New York

Cassella
Color Company
Artificial
Dye Stuffs
NEW YORK
BOSTON
PHILADELPHIA
PROVIDENCE
ATLANTA
MONTREAL

Castor Oil our own make and Castor Oil Products. Unsurpassed in quality. They are the standards.

BOSSON & LANE,
MANUFACTURERS
ALIZARINE ASSISTANT
TURKEY RED OIL
SOLUBLE OILS
OLEINE
B. & L. ANTI-CHLORINE (ultra bleaching process)
OLO SOFFENE (superior cotton softener)
CELLULINE—For cotton warps
SIZING AND FINISHING COMPOUNDS
Works and Main Office, ATLANTIC, MASS. (Suburb of Boston.)

Berlin Aniline Works

Main Office, 213-215 WATER ST., NEW YORK CITY

BRANCHES
Boston, Philadelphia, Chicago
Charlotte, Cincinnati

SPECIALTIES

Sulphur Blacks, Sulphur Blues, Sulphur Browns, Sulphur Greens, Sulphur Yellows, Indocyanines, Nerols
Metachrome Colors
Zambesi Black V and 2G

Manufacturers and Importers of

Aniline and Alizarine COLORS

FARBENFABRIKEN OF ELBERFELD CO.

IMPORTERS OF

Alizarine, Aniline Colors and Dyestuffs

117 Hudson Street, NEW YORK

BOSTON 32 India St.
PROVIDENCE 27 Pine St.
PHILADELPHIA 9-11 No. Water St.
CHICAGO 133 E. Kinzie St.
CHARLOTTE, N. C. 509-513 Trust Building
TORONTO, CANADA 14 Front St., East

KALLE & CO., Incorporated

Selling Agents for

ANILINE COLORS

Manufactured by

KALLE & CO., A. G., Biebrich-on-the-Rhine, Germany

Main Office, 530-36 Canal St., New York. Branches, Boston, Providence, Philadelphia, Greensboro, N. C.

Aniline Colors
Alizarine Colors
E. M. THAYER & CO.
411 Atlantic Avenue and 74 Purchase St., Boston, Mass.
Sulphide Colors
Extracts & Chemicals

Starch, Dextrine, Gum and Glue,

STEIN, HIRSH & CO.,
358 Washington St., NEW YORK
Chicago Philadelphia Boston

C. Bischoff & Co.,

451-453 Washington St., NEW YORK.

BRANCHES:
229 N. Front St., Philadelphia.
124-126 Purchase St., Boston.
196 Michigan St., Chicago.
10 Weybosset St., Providence.
416 St. Paul St., Montreal.

PYROL COLORS FOR COTTON

of every shade and description, absolutely fast to sunlight, fulling, acids, etc.

Domingo Alizarine and Domingo Chrome Colors for Wool,

dyeing either after the one bath method absolutely fast, or on chrome bottom.

GEISENHEIMER & CO.

189 Front Street, NEW YORK.

Chemical Works Griesheim-Elektron.

Oehler Works

Branch Offices :
19 Pearl Street, Boston, Mass.
136 Chestnut Street, Phila., Pa.
Atlanta, Ga.

Aniline Salt and Oil, Aniline Colors.

TANS A SPECIALTY.

SULPHUR BLACKS, BLUES, BROWNS.

CHEMICALS.

AUTOGENE BLACK BEE

Manufactured by

The St. Denis Dyestuff and Chemical Company, Ltd., PARIS, FRANCE

Originators of the Sulphur Color Industry

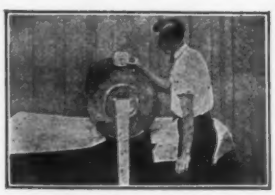
AS REGARDS SHADE, DURABILITY AND COST OF DYEING, THE BEST SULPHUR BLACK EVER PRODUCED

SAMPLES AND FULL PARTICULARS FROM

Walter F. Sykes & Co., Sole U. S. Agents

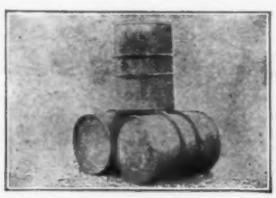
Boston—113 Broad Street. New York—85 Water Street. Philadelphia—132 Chestnut Street

"SOLVAY"



CALCIUM CHLORIDE

Used by the largest Cotton Mills, Print Goods Mfgrs. and Sizing Makers.



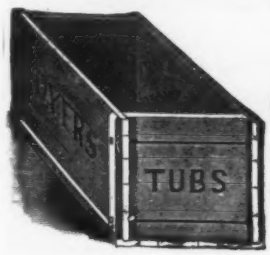
Granulated

Liquid

Carbondale Calcium Company

General Sales Agents

Carbondale, Pa.



Established 1868.

AMOS H. HALL, SON & CO.,

Manufacturers of

Cedar Vats and Tanks

2915-2933 North Second Street,

PHILADELPHIA, PA.

Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.

Hours from 12 to 1

PURE EXTRACTS.

STAINLESS & VIRGINIA SUMAC, QUERCITRON BARK

CONCENTRATED FLAVINE

In these days of the competition of inferiority and adulteration it is well to do business with this firm, who adhere to the standards set by them years ago.

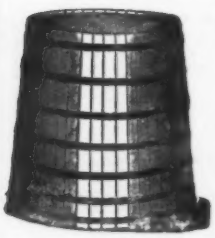
PURITY, STRENGTH AND UNIFORMITY GUARANTEED

J. S. YOUNG & COMPANY LIMITED

HANOVER, PA.

G. WOOLFORD WOOD TANK MANUFACTURING CO.

MANUFACTURERS OF

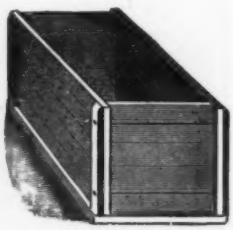


CEDAR AND CYPRESS

TANKS AND VATS

For Bleaching, Dyeing and Finishing.

Reservoir Tanks of any Capacity or Shape for Sprinkler Systems and all purposes.



Office 1429 Chestnut St., Philadelphia, Pa.

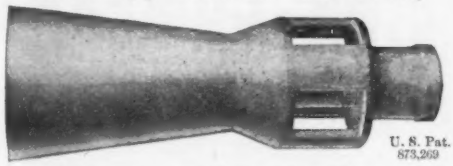
TANKS

that are built for long service

TANKS

that meet every textile requirement

GEYSER WATER HEATER



U. S. Pat. 873,269

To attach to end of steam pipe for heating liquids in tanks or vats. Modifies that disagreeable noise caused by the direct introduction of a steam jet and raises the liquid to the required temperature in about 70% of time required by latter. By its thorough circulation it distributes an even temperature throughout the tank. Price list upon application.

C. G. SARGENT'S SONS CORPOR., Graniteville, Mass.

Soft Clear Water.

We-Fu-Go and Scaife Water Softening Plants, and Scaife Water Filters can be seen in actual operation in Textile Plants in any part of the U. S. Apparatus designed to suit each special case, and we guarantee results. Write for Illustrated Catalogue.

WM. B. SCAIFE & SONS CO., Pittsburgh, Pa.

IF

you size or finish your goods,

IF

you strip your goods,

DIASTAFOR

can show

ADVANTAGES

from standpoint of economy as well as quality of fabric.

The American Diamalt Co.

Riverside, - - - Cincinnati, Ohio
Room 87 Essex Bld., opp. South Sta., Boston
1091 Drexel Bld., - - Philadelphia

Siemens & Halske. A.G.

Hudson Terminal Building
Room 1559 N. Y. City

We are introducing a

NEW Bleaching Process

that does away with the guess-work and inconvenience of the obsolete chloride of lime solution.

It is based on

SCIENTIFIC PRINCIPLES

Has been proved by years of

PRACTICAL EXPERIENCE

Needs hardly any attention, yields a

UNIFORMITY OF PRODUCT

never obtained hitherto and

REDUCES LOSS IN WEIGHT

4% to 5% less than with the old chloride of lime process.

EVERY UP-TO-DATE COTTON OR PAPER MILL NEEDS IT

Dealers and Contractors Wanted

THE CYPRESS LUMBER CO.

MANUFACTURERS OF

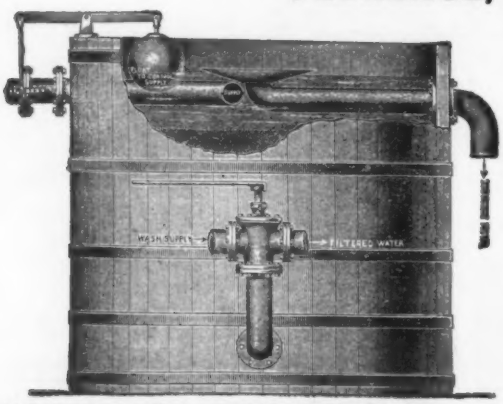
TANKS

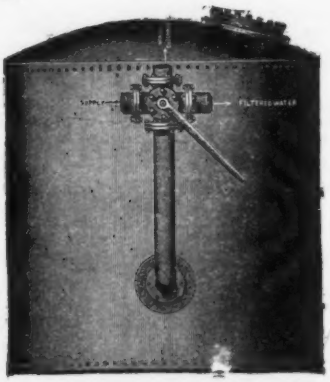
OF ALL KINDS

Factories at
Apalachicola, Fla.
and
Boston, Mass.

NORWOOD ENGINEERING COMPANY,

FLORENCE, MASS.





WILSON FILTERS FIRE HYDRANTS

Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

FILTERS AND WATER SOFTENERS

Hungerford Filters having a daily aggregate capacity of over thirty million gallons per day are now in operation in the textile mills of America.

Estimates and plans for proposed installations submitted without cost.

HUNGERFORD & TERRY

PENNA. BLDG., PHILADELPHIA, PA.

NEW ENGLAND BUTT COMPANY,

304 PEARL ST., PROVIDENCE, R. I.

BRAIDING MACHINERY

ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

SHOE AND CORSET LACES, BANDING

AND ALL BRAIDED FABRICS.

THE GROSSER KNITTING MACHINE CO.

WOOL EXCHANGE
260 W. Broadway

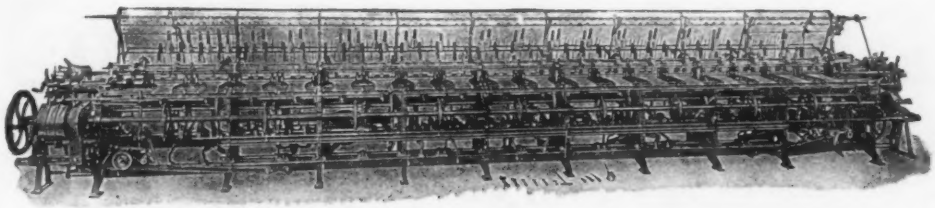
MAX NYDEGGER **NEW YORK**

PHILADELPHIA OFFICE 435 BOURSE BLDG.

All Special Machines for Any Article That Is Knit

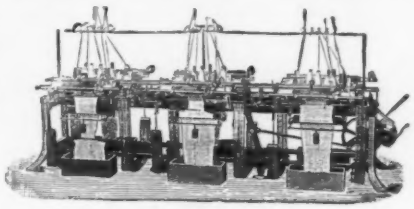
Full Fashioned Hosiery Machines

System **G. Hilscher, Chemnitz, Saxony**



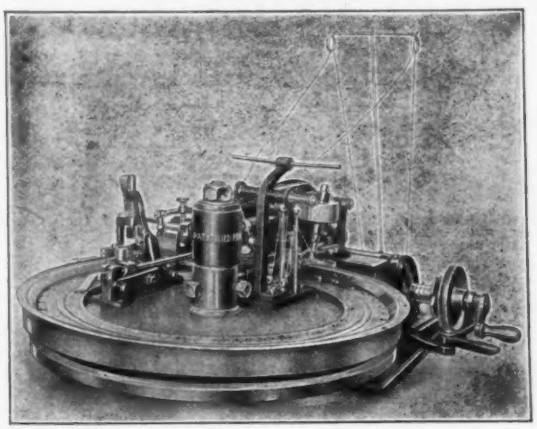
18 Section "COTTON HILSCHER" Machine for Full Fashioned Hosiery, Silk, Cotton, Wool, etc.
Gold Medal, Paris, 1900 Numerous Patents Covering Special Improvements

GROSSER Flat Knitting Machines
For HAND Power or FULLY AUTOMATIC Power MACHINES. Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand. Power Machines to be seen in operation.



CIRCULAR FRENCH FRAMES
C. Terrot Söhne, Cannstatt, Würt, famous builders of the best Circular Frame for Finest Underwear, Fleece Linings, Gloves, Special á-jour (openwork) Fabrics, etc.

RASHEL MACHINES [Double Rip Warp Knitting Machines.]
For Fancy Goods in largest variety, Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc., in silk, wool cotton.



The LOOPER THAT LOOPS!
Two thread lock stitch machine with reliable trimmer and raveller producing *indistructible, flat elastic* seam.
No Hosiery or Underwear plant up to date without this machine.

DIAMOND OVERSEAMERS
for all classes of selvege goods, Full Fashioned Hosiery, Underwear, etc.

FINISHING MACHINES for Knit Goods of all styles.

WINDERS for finest yarns.

Information, Samples and Specifications at Your Disposition

FRIEDBERGER-AARON MFG. CO.

LEADING MANUFACTURERS

Braids and Edgings

FOR TRIMMING

Ladies' Ribbed Underwear

OUR MOTTO: Correct Goods
Right Prices
Prompt Deliveries

Mills: Germantown, Philadelphia

Post Office Address,
Logan Station, Philadelphia

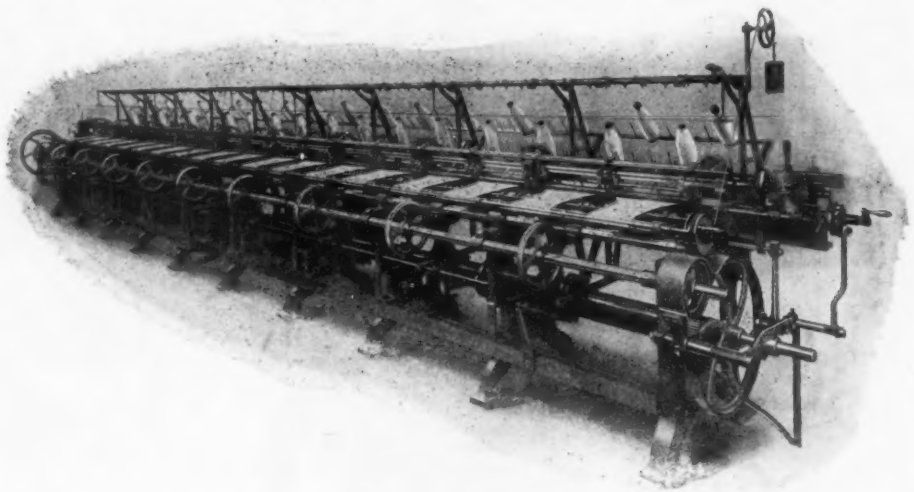
Full Fashioned Hosiery Machines

BUILT BY

SCHUBERT & SALZER

CHEMNITZ, GERMANY

Largest Manufacturers of all Classes of Hosiery Machines



Best constructed and most productive machines in the market for the manufacture of Full-Fashioned Hosiery in Cotton, Lisle or Silk in all gauges, from 14 to 32 needles to the inch, from 12 to 24 sections.

Split-Sole, Plaiting, 2, 3 or 4 Color Striping
Single or Double Lace Attachment.

Also: New Jacquard Lace Hosiery Machines.
Ribframes Winders

REFERENCES:—All the leading manufacturers of full-fashioned hosiery in this country.

AMERICAN REPRESENTATIVE:

OTTO WALTHER, 507 Bourse, Philadelphia

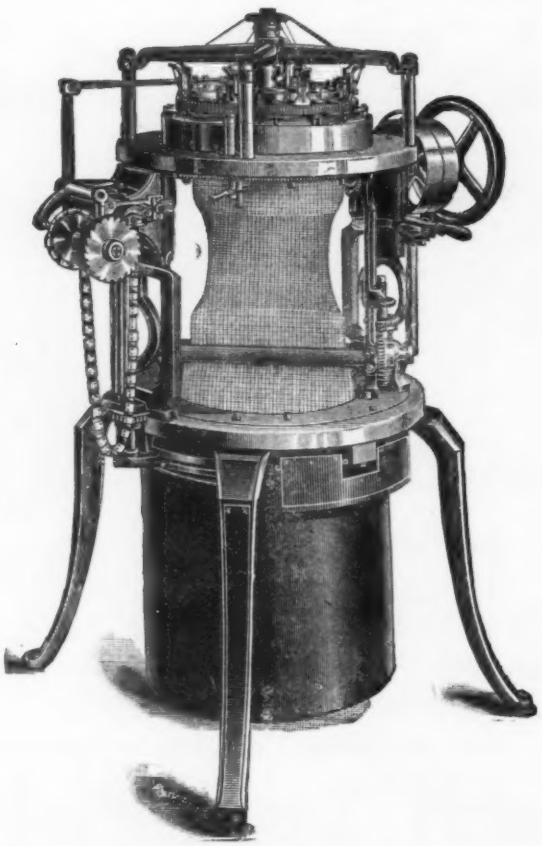
Wildman Manufacturing Co.

Norristown, Penn., U. S. A.

Manufacturers of

Circular Rib Knitting Machinery

Automatic
Stop
Motions



Electric
Cloth
Cutters

AUTOMATIC AND PLAIN

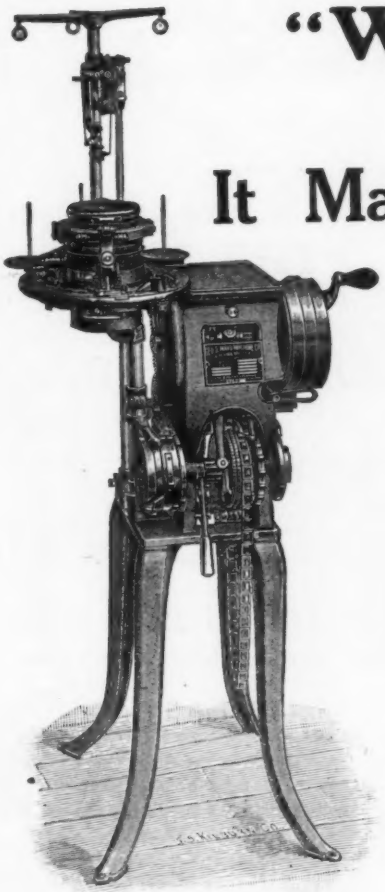
For all classes of Ribbed Hosiery, Underwear, Combination Suits, Sweaters, Etc.

OVER 1000 SOLD

In Three Months

This is the Record from Dec. 1st, '08 to Feb'y 28, '09 of

Mayo's 1909 Model Full Automatic Knitter



"WHY?"

because

It Makes Good

on its claims, viz:

Largest Production

Lowest Cost

Simplest Mechanism

Best Construction

For particulars write to

GEO. D. MAYO MACHINE CO.

GEO. D. MAYO, Pres. and Gen. Mgr.

Laconia, N. H.

Philadelphia Showroom, Knickerbocker Bldg., 6th and Arch Streets

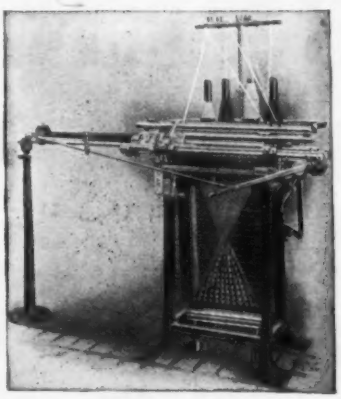
Edouard Dubied & Co.,

Couvet, Switzerland,

Leading Manufacturers of

Flat Knitting Machines

For Hand and Power
Full Automatic, Etc.



Best constructed and most productive machines on the market for manufacturing sweaters, gloves, sporting goods, etc.

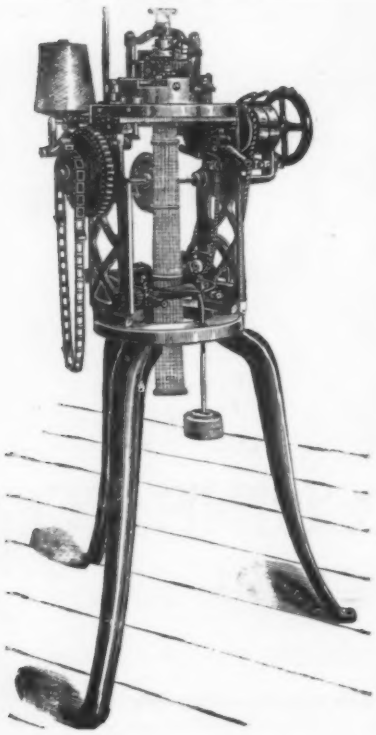
Acknowledged by experts, users and judges to be

"THE BEST"

Machines can be seen in operation by appointment. *For particulars apply to*

E. O. SPINDLER, Agent,

350 Broadway **Room 515** **NEW YORK, N. Y.**



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

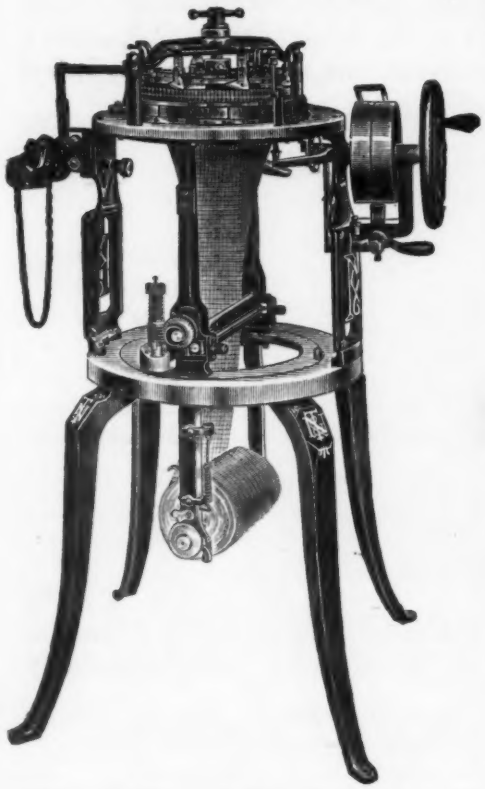
For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our Improved Automatic Ribber with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

NYE & TREDICK CO.

718-720 Cherry Street,
PHILADELPHIA, PA.



Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. Correct Construction, Excellence and Durability.

LATEST IMPROVEMENTS

QUALITY OF FABRICS AND PRODUCTION

UNEXCELLED

NYE & TREDICK CO.

"Nothing so Good as a Good Finish"

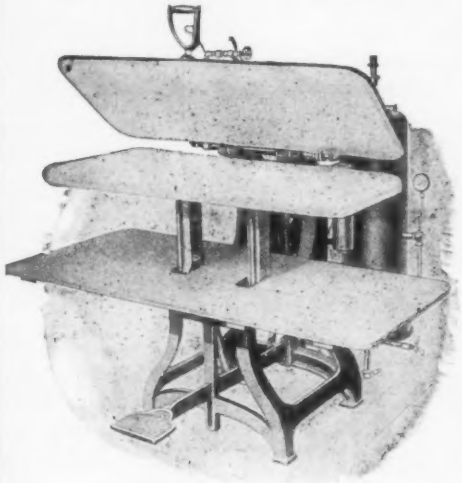
We are speaking of the finish on Knit Goods as produced by the

Hoffman Press

Presses a full garment in one operation, leaving it smooth and of fine finish.

Will not break buttons.

Floor space required—4 feet square.



The "Hoff-Man" F.

Write us for prices, particulars and illustrated catalogue

United States Hoffman Company

229 Temple Street

SYRACUSE, N. Y.

Higher Speed

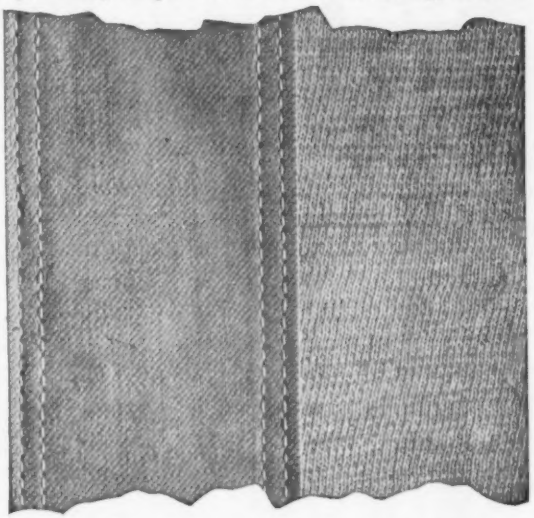
To Reduce Cost of Production by Increasing Output of Operators

Higher Efficiency

USE

Multiple Needle Machines

For all Multiple Needle Operations, whether for Ornament or for Service, where it is desired to have a plurality of parallel rows of stitching, needles spaced as desired



Yielding Bottom Presser Foot to be used where different thicknesses of Fabric are being Stitched Simultaneously

Special Fittings and Attachments now ready for Numerous Manifold Operations

Greater Simplicity

Style 16100 A-4 Needles-8-80-8 Gauge
Stitching Front Facings to Shirts
One Operation

Greater Durability

Union Special Machine Company

BRANCHES
96 South St., Boston, Mass.
50 E. Main St., Amsterdam, N. Y.
51 Mohawk St., Cohoes, N. Y.
776 St. Catherine St., W., Montreal, Can.

HOME OFFICE AND WORKS
75 E. Kinzie St., Chicago, Ill.

GENERAL EASTERN OFFICE
47 Leonard St., New York City

BRANCHES
731 Arch St., Philadelphia, Pa.
806 Main St., Cincinnati, Ohio
1507 Olive St., St. Louis, Mo.
684 Mission St., San Francisco

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

Hosiery Boards.

James Taylor, 121 Arch Street, Phila., Pa.

DEALER IN NEW AND SECOND HAND

Knitting Machinery

Wishes to call the attention of the manufacturers of Ribbed Hosiery and Underwear to the new patented

Double Acting Attachments for Ribbers

sold on its merits only. Here are a few of its MERITS:

Double Production; as it is double acting; fills your orders in half the time or more orders in the same time; you produce in six months what it now takes you one year to do; does the work of two machines.

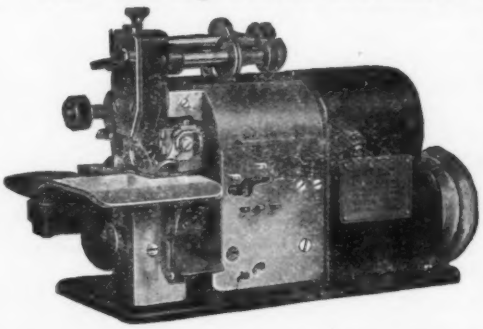
Costs Less; requires just half the space, that means less rent or investment; weigh or measure the product, then compare with present methods; makes a good RIBBER better. New parts all built on the interchangeable PLAN. We are changing over either WILDMAN, BRINTON or SCOTT & WILLIAMS MAKES of machines.

Call and see machines on exhibition at 121 Arch St., Phila.

The Merrow

High Speed Overseaming, Overedging and Scallop Stitch Machines are

FAST
DURABLE
Light Running



OUR STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

USE STYLE 18 for Horse Blankets. STYLE 17 or 22 for Bed Blankets. STYLE 35 B SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

Send for Catalogue and Samples.

THE MERROW MACHINE CO. HARTFORD, CONN.

Knickerbocker Building, Sixth and Arch Sts., Phila. 467 Broadway, cor. Grand St., N.Y. 237 Market St., Chicago, Ill.

EXCELSIOR KNITTING MACHINE MFG. CO.

Meadow and Washington Streets

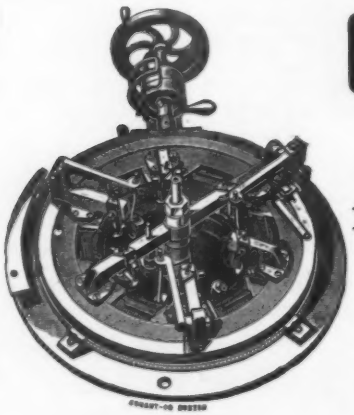
ALLENTOWN, PENNA.

BUILDERS OF

Full Automatic Knitters

With or without **Transferring Device**

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

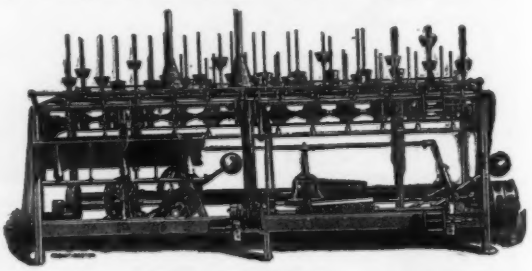


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

The Invincible

Full Automatic.

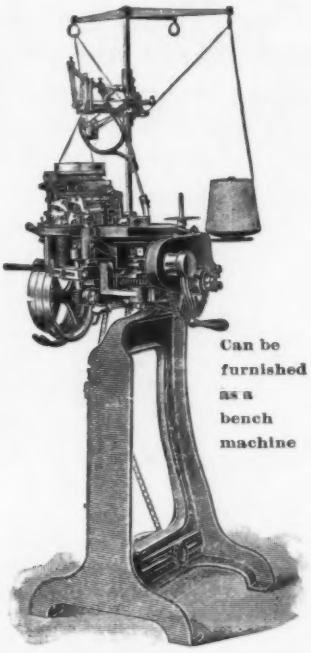
"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.
SIMPLE, POSITIVE AND EASY TO OPERATE.

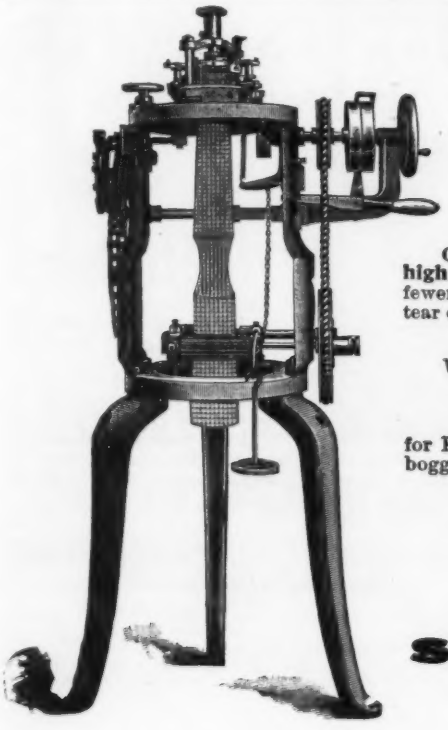
E. JENCKES MFG. CO.

Pawtucket, R. I.

PHILADELPHIA OFFICE,
101 North Sixth St.



Can be furnished as a bench machine



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

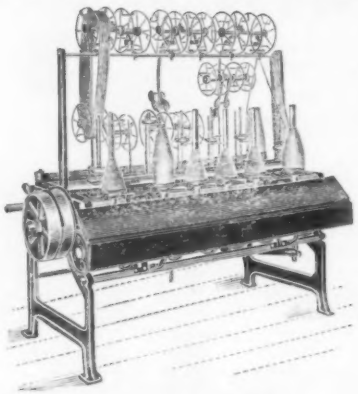
STAFFORD & HOLT,

LITTLE FALLS, N. Y.

A. W. ALLEN

2427 Mascher St., Phila.

WINDERS



6 SPINDLES UP

The best winder on the market. If you are not using one or more try one.

GENERAL MACHINE WORKS

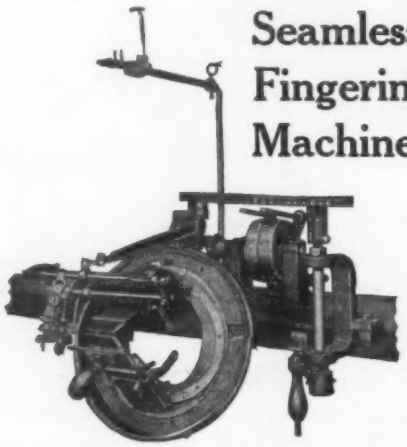
YORK, PA.

Manufacturers of

Ribbers

for Hosiery, Underwear and Gloves. Splicers and Sleevers

We carry a large stock of needles and can supply your wants promptly. We are prepared to cut cylinders and dials promptly and accurately. We develop and market new ideas for any one. Your inquiries will be appreciated.



Seamless Fingering Machine

Knit Glove Manufacturers

If you want to be up to date, ask us for particulars of this machine. Indorsed by leading manufacturers.

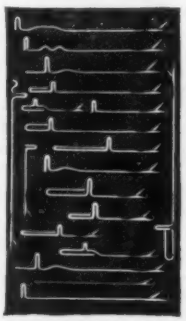
James Leckie & Son,

821 N 13th Street, Phila, Pa.

CHARLES COOPER,

BENNINGTON, VERMONT,

MANUFACTURER OF



Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder, **Spring Needle Cylinder Rib-Top Machines** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

COLLARETTE ATTACHMENT

American Representative:
G. H. ROGERS,
509 Clinton Street, Hudson, N. Y.

European Representative:
FELIX LEDERER,
1x/4 Schubertgasse, Nr. 22, Vienna, Austria.

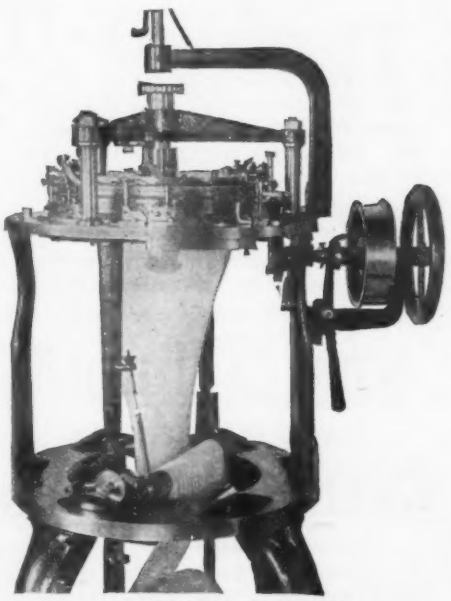
Established 1870.—Incorporated 1890.

CRANE M'F'G. CO.

LAKEPORT, N. H.

Manufacturers of

Spring and Latch Needle Machines for both rib and plain work, producing a great variety of fabrics. Patent removable hardened Wing Burr Wheels.



SPRING NEEDLE RIB MACHINE

INCREASE IN PRODUCTION

Of 30 to 60%

BY USING THE

Climax High Speed Automatic Attachment for any make of Circular Rib Knitting Machines

FLAT KNITTING MACHINES

equipped with the improved

CLIMAX POWER MOTION
AUTOMATIC TAKE UP
AUTOMATIC RACKING
METAL STAND

CLIMAX MACHINE CO.,

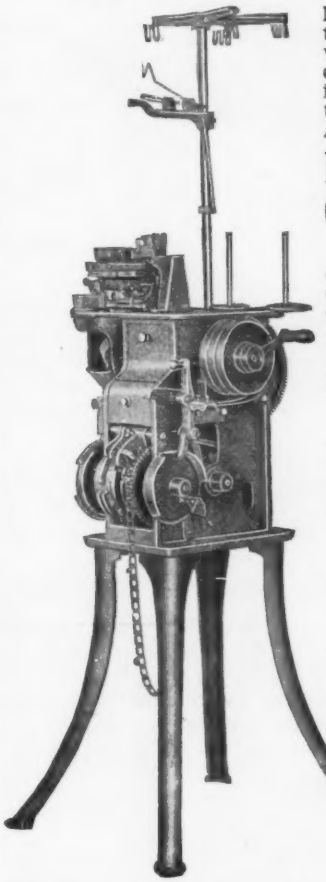
1753 N. Howard St., Phila, Pa.

"THE BANNER"

Hemphill's Latest

A FULL AUTOMATIC MACHINE

Specially adapted to



Manufacture Hose with Linen or Mercerized heel or toe.
Also for

Plaited Goods

and

String Work

High Splice

and

Double Sole

Largest Production

More Yarn Changes

Highest Speed

Simplest

Least Repairs

Produces a Superior Quality of Work.

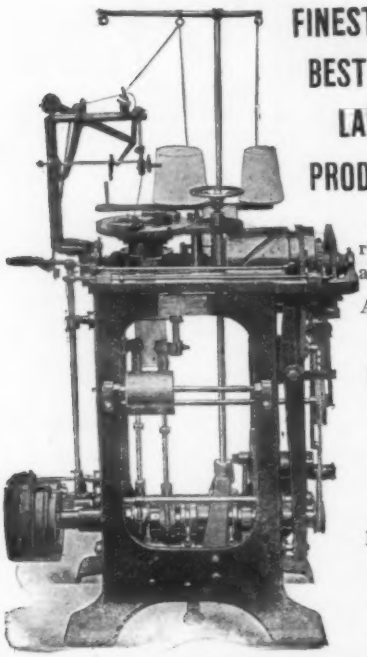
MANUFACTURED BY THE

Hemphill Mfg. Co.

131 Clay Street, PAWTUCKET, R. I.

"NATIONAL"

Stands for



FINEST GAUGES
BEST FABRIC
LARGEST
PRODUCT ON

Greatest Variety of Laces and Novelties.

Allautomatic.

Lowest Cost for Operating

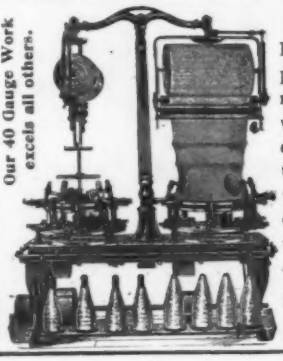
Also
Rib Knitting Machinery, Overedge, Crochet and Shell Stitch.

NATIONAL AUTOMATIC KNITTER CO.

1028 Susquehanna Avenue. PHILADELPHIA, PA.

We are the Oldest Manufacturers

of this Design of Spring Needle Knitting Machine in this Country



Our 40 Gauge Work excels all others.

40 years' experience

Do not be misled by people who became manufacturers in 1903 without any previous experience who are trying to represent that they are the oldest manufacturers. Investigate. Call and see our fine gauge work.

Robt. W. Gormly & Co.
Troy, N. Y.

The New Boss Seamless Knitter

Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

Send for prices and particulars.

THE BOSS KNITTING MACHINE WORKS,
Cor. Elm and Reed Sts., Reading, Pa.

"Acme" and "Hemphill"

SEAMLESS HOSIERY

Knitting Machines

built by

Mayo Knitting Machine & Needle Company

Franklin, N. H.

Answer all purposes in the *most reliable*, *up-to-date*, and *economical* manner. Write us for full particulars.

Manufacturers like our Latch Needles

because we make a superior grade of needles.

Philadelphia Office, Knickerbocker Bldg.

STANDARD MACHINES FOR HOSIERY MAKING

The STANDARD F, with attachments, can make any and all of these fabrics:

Plain Goods
Plaited Work
Three Color Stripes
Tipped Heel and Toe
White Foot
Changed Heel and Toe
Garter Top
Loopers Slack Course

Most Stockings—Best Fabrics—Longest Life

Standard Machine Company

OFFICE AND SHOW ROOMS

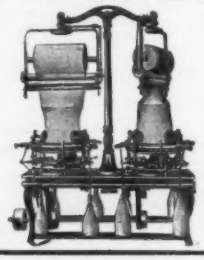
330-340 North 12th St., Philadelphia

We Are the Oldest Manufacturers
IN THE WESTERN HEMISPHERE
Of Circular Spring Needle Loop-Wheel Knitting Machinery.

TOMPKINS BROS. CO., Troy, N.Y.

We submit the following extract from the sworn testimony of R. W. Gormly, in U. S. Circuit Court, Northern District of New York, in equity, No. 6764:

Cross Question 123. How long have you been a manufacturer of knitting machines? Answer. I started in this business about the middle of May, 1900.



Tompkins Knitter

This design was adopted in 1875.

BUSINESS ESTABLISHED in 1846, before ROBERT W. GORMLY Was born, according to his testimony in the case above cited.

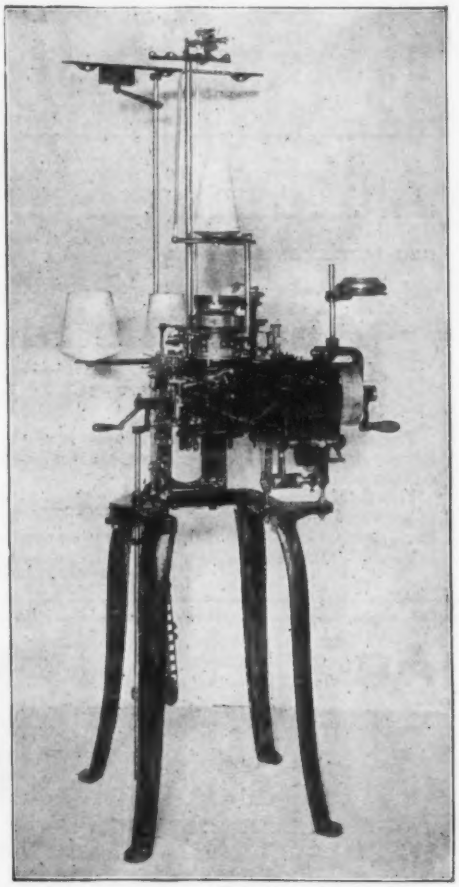
Full Automatic Knitters

For Ladies', Half Hose and Footing, also for

Ladies' Split Sole and Lace Hose

Full Fashioned Legger and Heeler for Full Fashioned Hose.

Measures length like a Rib Frame.

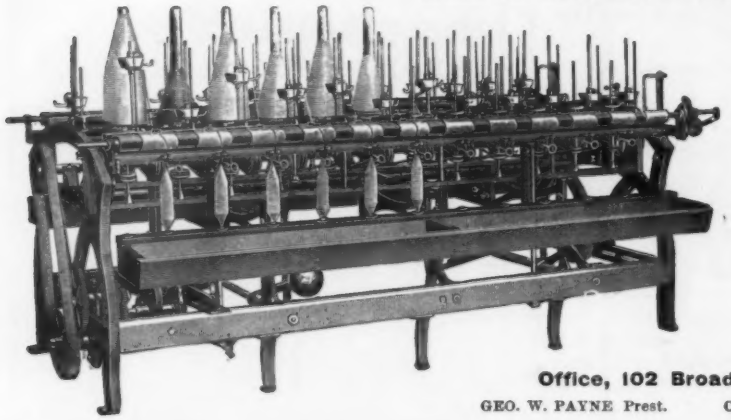


Paxton & O'Neill

537-41 North Third Street, Philadelphia.

OVER 1,900 PAYNE WINDERS IN USE

By Hosiery Manufacturers,
Wind for Cop, Skein or Bobbin.



Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers for doubling 2, 3, or more ends into one.

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Office, 102 Broad Street, Pawtucket, R. I.

GEO. W. PAYNE Prest. CLINTON F. PAYNE, Sec'y. and Treas.

Automatic Machine Works

GEO. W. STEVENSON, Inventor and Proprietor 315-315½ Elm Street, Reading, Pa.

Builders of

Automatic Singeing Machine and The Cold Hosiery Press.

The Automatic Singeing Machine is the only machine on the market equipped with a **Patent Single Plate Positive Stripping Device,** which saves gas, hose and labor. Built in two sizes double and single feed.

The Cold Hosiery Press is very simple to operate, is less expensive, no complicated parts and requires very little power. With this press the life of the yarn is retained and the finish of the hosiery after coming out of the press cannot be equalled by any other press hot or cold. The press is built in two sizes.

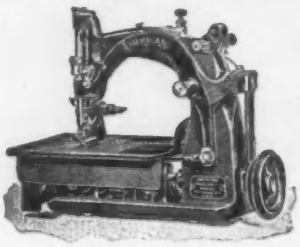
For further information address as above

American Raveller Company

PHILMONT, N. Y.

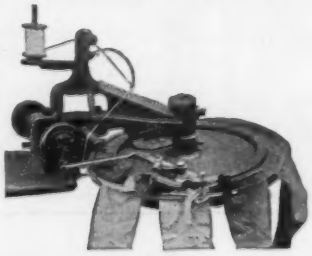
MANUFACTURERS AND PATENTEES OF

High Speed, Elastic Stitch Sewing and Trimming Machines



Also ravelling machines for making knit underwear and hosiery full fashioned.

2 line and twin needle machines for fancy stitching.



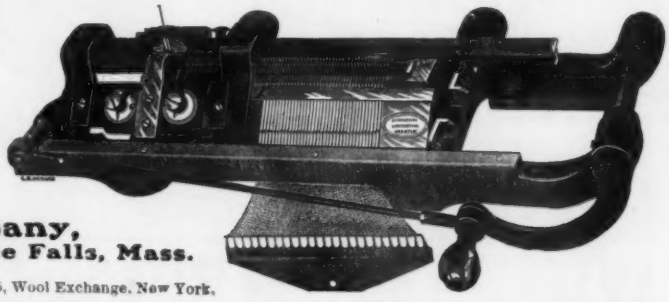
The LAMB

LEADER OF KNITTERS

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

Circular Machines, Rib Top and Seaming Machines.



Lamb Knitting Machine Company,

P. O. Box, 5888, **Chicopee Falls, Mass.**

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 505, Wool Exchange, New York.

David Richter, Inc.

were the first machine builders in Chemnitz, Germany, to construct

Full Fashioned Hosiery Machines

upon the Cotton principle and which since their introduction have never been excelled by any other machine builder; be it in construction or productiveness. Built in all gauges and for any material, cotton, wool, lisle or silk.

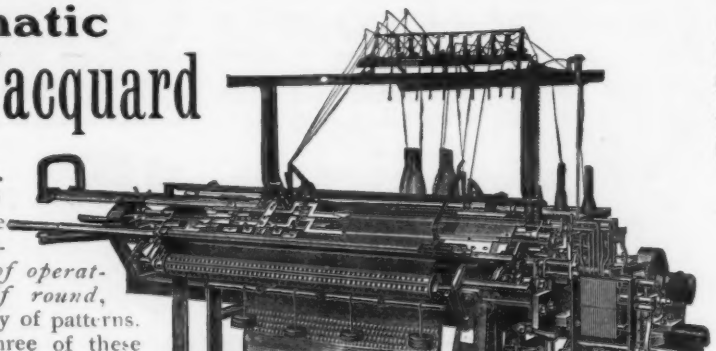
Sole American Representative,

E. O. SPINDLER, 350 Broadway, New York, N. Y.

Full Automatic Noppen & Jacquard

for high-grade sweaters, jerseys, etc. Latest improvements

Recognized as the best in the market. With Jacquard attachment allowing *change of operating mechanism every half round*, therefore unrivaled in variety of patterns. One operator attends to three of these machines. High speed. Large production. Ask for samples and full particulars. State gauge and size you need.



Claes & Flentje,

Mühlhausen Thr., Germany.

Representatives, **AINSLIE KNITTING MACHINE CO., Ainslie & Humbold Sts., Brooklyn, N. Y.**

Where all kinds of our hand and automatic machines can be seen working.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,
N. W. Cor. Lehigh Ave. and Mascher Street,
PHILADELPHIA.

WILLIAM C. BULL,

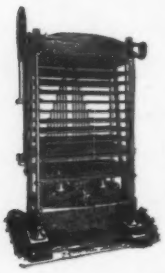
BENNINGTON, VERMONT.
MAKER OF

For Ladies', Gents' and Children's Goods.
Latest Styles.
Best Workmanship.

Drying Form Boards

OF EVERY VARIETY.

The CRAWFORD



HOLLOW STEAM

PLATE PRESS

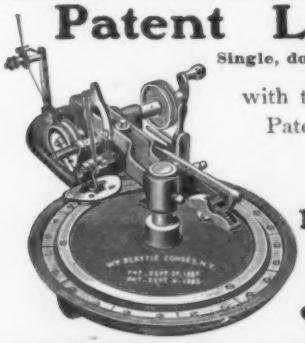
For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,
Successors to
J. J CRAWFORD & SON,
NASHUA, N. H.
Established 1868.

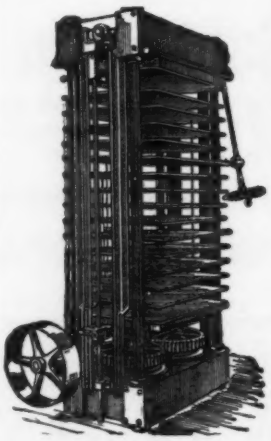
Patent Loopers



Single, double and two thread Stitch.

with the
Patent Raised
or
Straight Points.

Beattie Manufacturing Co.,
Cohoes, N. Y.



Reliance Hot Plate Press

For Hosiery and Underwear Trade.

For price and particulars address

CHARLES HART
Hedge and Brown Sts.,
Frankford, Phila., Pa.

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

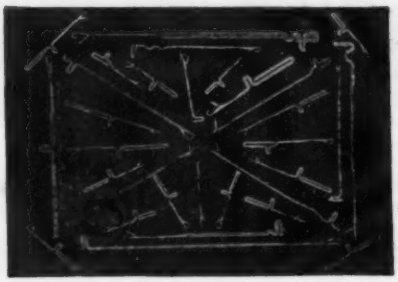
Oils and Mill Supplies

Sewing Machine Belting, Press Boards, Belt Hooks, Lace Leather, Leather Belting, Latch Needles, Oilers of every description, Mill Baskets and Brooms, Mill Banding, Rings and Springs, Packings of all kinds, Fire Pails, Shears and Trimmers, Cloth Knives, Etc.

E. W. Murphey & Co.
HUDSON, N. Y.
Established 1831.

TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



Dodge Needle Co., Manchester, N. H.

WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

WM. BREEDON'S SON,

MANUFACTURERS OF

Spring Knitting Needles

AND BURR BLADES OF ALL KINDS.

AMSTERDAM, - N. Y.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,

2134 to 2130 East York St., PHILADELPHIA, PA.

Standard Latch Needles

MANUFACTURED BY

EXCELSIOR NEEDLE CO.,

TORRINGTON, CONN.

The Largest Manufacturers of Machine Needles in the World.

STANDARD

TRADE MARK.

Longer Wear. Better Work.

Less Mending. Fewer Seconds.

Have you tried our

Patent Milled Rivet?

Agents

C. B. Barker & Co., Ltd., 42 W. 15th St., New York.
Manufacturers' Supplies Co 418 Arch St., Phila.
C. Shawl, 414 Polk St., San Francisco, Cal
J. C. Strittmatter, 2a Calle de San Francisco No. 9, City of Mexico, Mexico.

L. T. IVES CO.

Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

KEYSTONE LATCH NEEDLE CO.

JOHN C. EGLY, MGR.

MANUFACTURERS OF

Patent and Regular Latch Needles

Needles for all makes of Knitters and Ribbers.
Keystone Spring Bottom Needles for all makes of Knitting Machines always in stock for immediate delivery.
Special Needles made to order.

543 W. Lehigh Avenue, Philadelphia, Pa.

TEXTILE MACHINE WORKS

THUN & JANSSEN, READING, PA.

Manfrs of BRAIDING MACHINES

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers. Measuring Machines, Reelers, Singeing and Finishing Machinery. Special Machinery.

The Continental Latch Needle Company.

Manufacturers of the BEST GERMAN NEEDLE on the Market.

RIVETS GUARANTEED. Samples on application. SPRING NEEDLES A SPECIALTY.

120-122 LIBERTY STREET, - - - - - - - - - NEW YORK.

McCormick Turbines

both Cylinder and Wicket Gate, giving **ENORMOUS** power are used in hundreds of textile mills throughout the world.

We make a specialty of designing turbines to meet the requirements of the public.

We build Francis turbines in spiral flumes to operate under high heads.

Boston Office, 176 Federal Street.

S. MORGAN SMITH COMPANY, York, Pa., U.S.A.

THE NATURAL RESULT

Of over rating lightness of construction and the desire to place on the market a pump that is cheap—is seen in the fact that during the past month we have replaced four pumps of other makes with

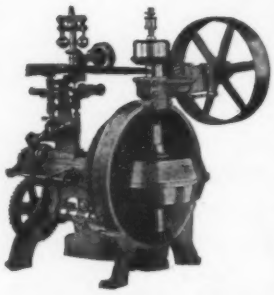
Goulds Efficient Power Pumps

We manufacture a complete line of Triplex Pumps for every service and will be pleased to send catalog on application.

THE GOULDS MFG. COMPANY,

SENECA FALLS, N. Y.

New York Boston Pittsburg St. Louis Chicago Philadelphia
New Orleans Los Angeles San Francisco Louisville



Water Wheel Governors

OUR compensating type more fully meets the needs of Textile Mills than any other. This is due to its being the only successful quick acting, mechanical, governor and its perfect control of large as well as small changes. 1500 of this type in use in mills and electric power plants.

Woodward Governor Co., Rockford, Ill.

HUNT-McCORMICK WATER TURBINES

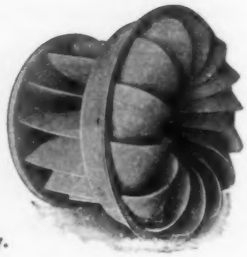
CYLINDER or BALANCE GATE CASING

Highest Efficiency, Greater Power,
Easy and Quick Regulation,
Steady Motion, Durability.

RODNEY HUNT MACHINE CO.

ORANGE, MASS.

BRANCH OFFICE: 70 Kilby St., Boston, Mass.



See our Woolen Machinery advertisement on page 47.

MILL VENTILATION AND COOLING AND MECHANICAL DRAFT FOR BOILERS

In Small Space and at Small Expense by Installing

"SIROCCO" Runner Patented

"SIROCCO" BLOWERS

The distinguishing features of the "SIROCCO" fan reside in its Blast Wheel, which is of drum form enclosed by usually sixty-four blades, which are long but narrow, and are curved forward.

Save 1/2 Space—1/3 Weight—1/5 Power And Do Their Work Silently

Write for new "SIROCCO" Catalogue

Sales Offices: New York, St. Louis, Phila., Chicago, Atlanta, Pittsburg.

SIROCCO AMERICAN BLOWER COMPANY

General Offices DETROIT

Works Detroit, Mich. and Troy, N. Y.

SALEM ELEVATOR WORKS

SALEM, MASS.

ELEVATORS

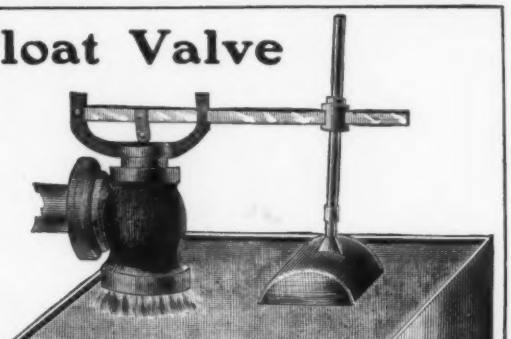
ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.

The "Kellogg" Float Valve

Is Warranted Always to Operate

as it has no packing gland which can be tightened up to cause it to stick, thereby causing the tank to overflow. It is a balanced valve and operates with a smaller float than any other make of valve of the same size.

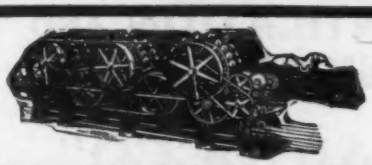


J. & W. Jolly, Inc.

500 East St., Holyoke, Mass.

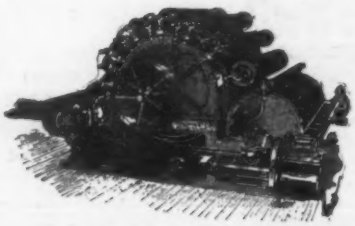
Manufacturers of the Original "McCormick Holyoke Turbine." Both Vertical and Horizontal

MAY 14 1909

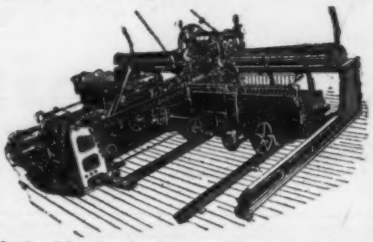


CARNETT MACHINES AND PICKERS

For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.



WOOLEN MILL MACHINERY



Including Rag, Wool and Burr Pickers, Wool, Worsted and Shoddy Cards, Mules, Yarn Twisters, Warpers, Dressers, Spoolers, Etc.

Complete Equipment for Manufacturing Cotton Batting for All Purposes.

Special Carding and Spinning Machinery for manufacturing Yarn from such low grade stock as Mill Sweepings, Linters, Etc.

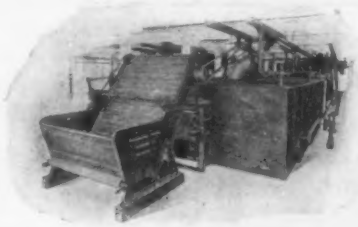
We reclothe or furnish new Metallic Toothed Cylinders and Rolls and relagg or furnish new Cylinders for any make of Rag Picker.

SMITH & FURBUSH MACHINE CO., Hancock and Somerset Streets, **PHILADELPHIA, PA., U. S. A.**

FIRE PROOF "PROCTOR" DRYERS

Formerly the "CYCLONE"

Built entirely of STEEL; no woodwork. All trouble with aprons overcome by the Inter-Locking Chain Conveyor. "It needs no adjustment."



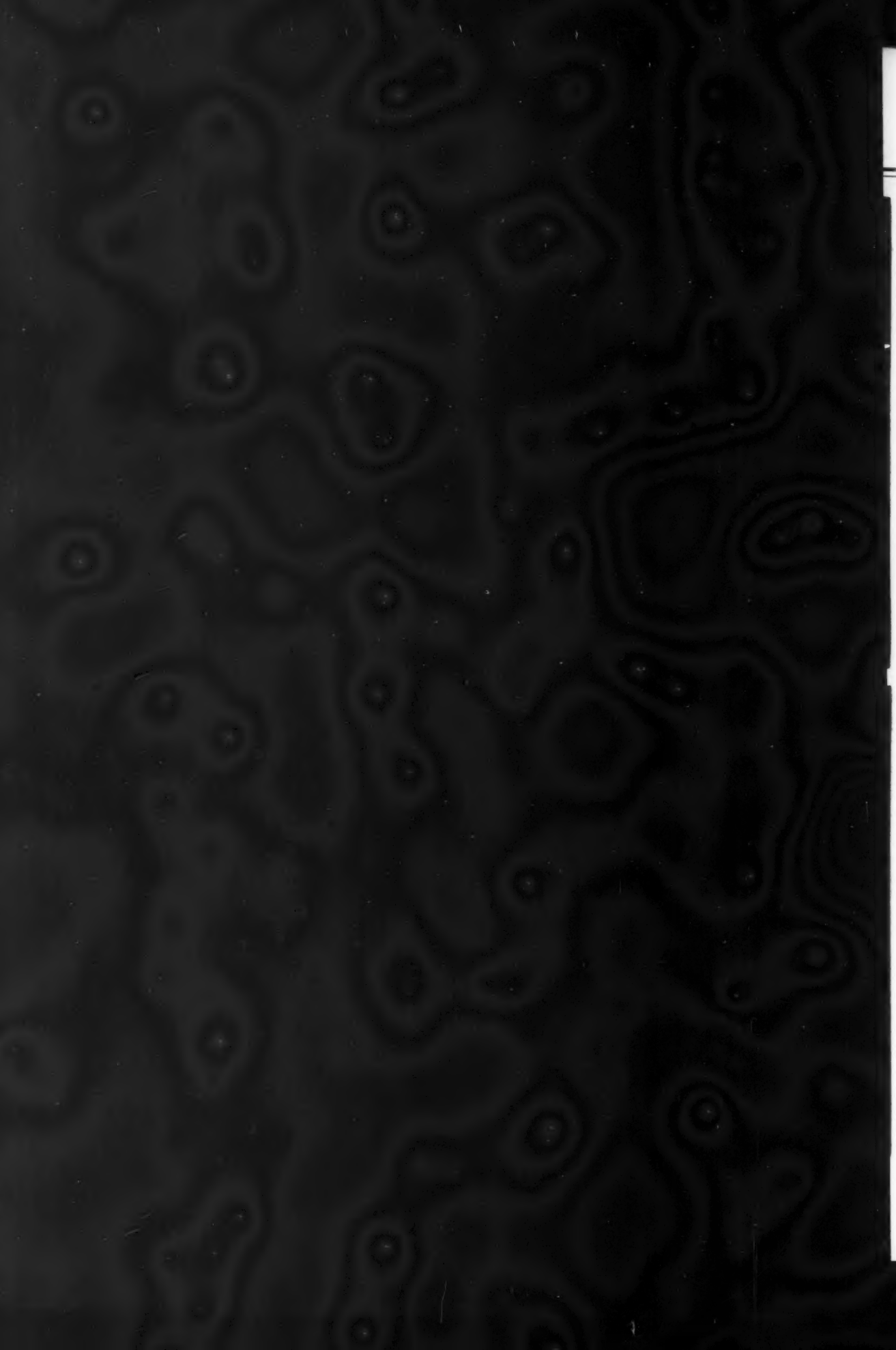
"Proctor" Dryer, Feed End.

The Inter-Locking Chain Conveyor Separate From Dryer.

Dryers for Cotton Stock, Wool, Rags, Cloth, Hosiery, Yarn, Underwear, Etc.

Complete Carbonizing Outfits. Iron Bowl Yarn Scouring Machines. Ventilating Fans.

THE PHILADELPHIA TEXTILE MACHINERY CO., Hancock and Somerset Streets PHILADELPHIA, PA., U. S. A.



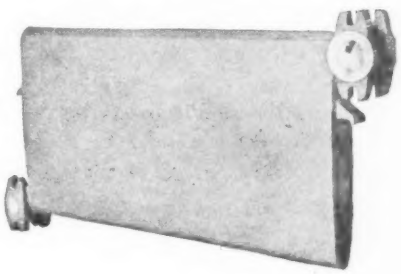
CELL DRIER MACHINE CO.

TAUNTON, MASS.

BOSTON OFFICE, 147 MILK STREET.

The unit of the **CELL DRIER** successfully operating wherever **Drying** has to be done at a minimum of **Cost.** Send for information regarding installation for

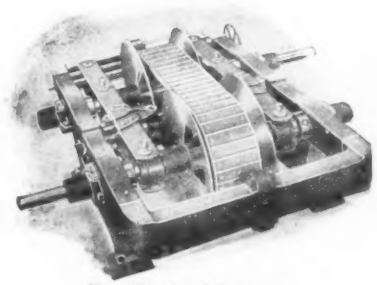
Singers
Water Mangles
Printing Machines
Steam Agers
Soapers



Tenter Frames
Mercerizing
Aniline Blacks
Nappers
Slashers

THE MILL EQUIPPED WITH

"Reeves" Variable Speed Transmission



for regulating the speed of Slashers, Singers, Drying Cylinders, CELL DRIERS, Printing and Dyeing Machines, Steam Agers, Tenter Frames, Dampeners, etc., produces the best and most reliable results. *Scrap* your cones.

Enquire of those who are using them.

Reeves Pulley Company,
Columbus, Indiana.

New England Agents,
CELL DRIER MACHINE COMPANY,
Taunton and 147 Milk St., Boston, Mass.

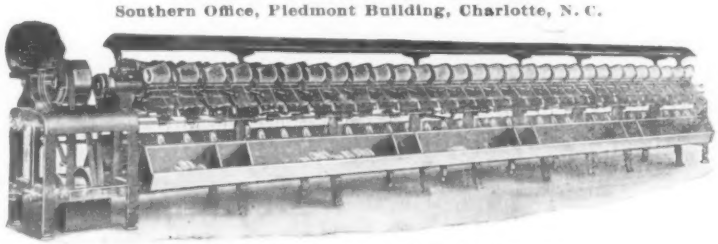
New York Representatives,
PATTERSON, GOTTFRIED & HUNTER,
146-150 Centre Street.

Foster Machine Company

WESTFIELD, MASS.

Southern Office, Piedmont Building, Charlotte, N. C.

Cone Winding.
Tube Winding.
Skein Winding.
Quill Winding.
Doubling.



Both "Open" and "Close" Winding Machines for every branch of textile manufacturing.

New Model No. 12 Cone and Tube Winder.

Less Card Waste

With new "Century Cards" (Rae's System) there is less waste than with any other cards.

By the addition of several workers more and better carding is done. Mixing is more thoroughly accomplished at the same time.

The Bramwell Feed attached has been much simplified in construction, so there is less wear and tear.

This system is a proven success. Come in and see them running.

The Lombard Machine Co.,
Worcester, Mass.

THE BELL SYSTEM

Manufactured by

THE CRISCOM-SPENCER CO.

90 West St., New York, N. Y.

NO SPRAY

NO WETTING

The case opens wide for easy access to evaporating surfaces.

The current of moistened air from the Humidifier reaches *all* parts of the room. Let us call, explain and quote.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES;

128 FEDERAL STREET, BOSTON, MASS.

New York Office: Park Row Building.